

Gilbert Anderson's Stutz getting the flag at the finish line on the winning lap of the Elgin national trophy race

Stutz Cars Triumph at Elgin Road Races

Cooper and Anderson Take First and Second in
Both Races—Elgin Trophy Won at 77.256
M.P.H.—C. A. C. Cup at 74.979

ELGIN, ILL., ROAD RACE COURSE, Aug. 21—Stutz racing cars came into their own in road racing to-day and yesterday when the new sixteen-valve racing cars took first and second places in the 301-mile race Friday for the Chicago Automobile Club trophy; and to-day, Saturday, when Stutz finished first and second in the Elgin national trophy for the same distance, both races being run over the classic 8.38 mile road race course lying on the outskirts of Elgin.

Friday Earl Cooper won from a field of nine starters averaging 74.979 m.p.h. with his team mate Gilbert Anderson second averaging 73.859 m.p.h., the two defeating such road racing masters as Barney Oldfield, who was third in his new Delage and De Palma who had trouble with his Mercedes that captured both races a year ago and who broke a valve rocker arm, covering but little over 100 miles.

To-day, Saturday, Stutz more than

The Winners at Elgin Elgin National Trophy

Car	Driver	M.P.H.
Stutz.....	Anderson.....	77.256
Stutz.....	Cooper.....	76.258
Duesenberg...	O'Donnell.....	75.769
Mercedes.....	De Palma.....	75.690

C. A. C. Trophy

Car	Driver	M.P.H.
Stutz.....	Cooper.....	74.979
Stutz.....	Anderson.....	73.859
Delage.....	Oldfield.....	72.467
Ogren.....	Alley.....	71.163
Duesenberg...	O'Donnell.....	70.836

duplicated its Friday performance, Anderson and Cooper again finishing one, two, with a Duesenberg driven by O'Donnell third and De Palma's Mercedes fourth.

While yesterday saw Elgin road records fall, to-day's race toppled existing records like the proverbial house of cards. Anderson averaged 77.256 m.p.h., over 2 miles higher than the Friday pace, and Cooper at 76.258 m.p.h. was also well ahead of all previous marks; in fact, to-day was record-breaking day as all four cars finishing averaged over 75 m.p.h. This speed is best realized when compared with the 1914 mark of 73.5 and yesterday's mark of 74.97.

A Spectacular Finish

To-day's race for the Elgin National trophy with the \$4,200 cash divided among the winners was not only the fastest ever held on the course but one of the most spectacular finishes in the

clusion that Stutz cars had all their own way from the early miles, De Palma stopping at 40 miles to repair a broken rocker arm and losing over 1 hr. There was no hope of his even being a contender but he went out for some of the 100-mile cash that was offered: In the meantime Barney Oldfield was experiencing some of his customary bad road racing luck. He stopped at the end of the first lap to change a right rear, his pit men doing poor work with the hand jack, the stop taking 73 sec. This handicapped him and it was soon seen that his new Delage, which was in its second American contest, was not yet tuned up and would not be able to battle on even terms with the Stutz machines. Barney's fastest lap was 6:36 as compared with 6:26 for the Stutzes. The two Duesenbergs were setting a little slower pace, the fastest lap being 6:37, leaving the real strife of the day to the two Stutzes. The Ogren driven by Thomas Alley eventually landed in fourth place, putting the Duesenberg fifth. The other five cars that started had dropped out by this time, for various causes, which are given, for the most part, on pages 366 and 367, where the mechanical and tire troubles are reviewed.

Racing Conditions Ideal

Racing conditions on the course were ideal for time excepting for high winds which held the cars back Friday; and Saturday the oiled road was slippery in places, owing to a heavy all-night rain Friday which lay in pools Saturday morning. Fortunately the high wind dried them, but the course was not at record speed until the race was three-quarters over. As a result the lap record of 6:11 established last year by Spencer Wishart in the Mercedes was not broken, De Palma putting his Mercedes around in 6:15.85 for the second last lap Saturday, a pace of 80.5 m.p.h. Second fastest went to O'Donnell's Duesenberg in 6:18, or 79.857 m.p.h. Anderson's Stutz made the third fastest in 6:19. or



Rounding hairpin curve on the 8.38-mile Elgin course, one of the places which required the most skilful driving

79.642 and Cooper was fourth in 6:26 or 78.206 m.p.h. The race was not a question of fastest laps but rather one of well-sustained speeds with the minimum of stops at the pits. Both races were gray-matter ones rather than matters of maximum speed and brute strength. It was measuring up and carefully balancing tire endurance with motor speed possibilities.

New Tire Record

Never has a road race of such distances been run with so few tire stops. Adding the races of both days gives a total mileage of 603.66. Anderson's Stutz made this entire distance without a single tire stop, a new road tire record. He used Silver-town cords. Cooper made but

one tire change in both days, this being made the first day at 250 miles. O'Donnell's Duesenberg made but one change in both days. De Palma did not make a single change in his Mercedes which covered 477 miles in the two days. Oldfield was the tire Jonah changing one the first day and four the second, a total of five. Of the other cars which were slower only one or two tire changes were made.

The entire race was a great demonstration of cord tires, which made their American debut in a road race, the Elgin course being a typical country gravel road with a well-oiled surface. The road was scarified last fall, all loose stones removed and the surface dragged regularly. Over a month ago it was oiled and to all intents and purposes is a typical road, wide enough in all places for two cars to pass and in many places wide enough for three cars to race abreast at 100 m.p.h. It must be remembered in connection with this tire performance that the track was cool. The sun scarcely shone on both days and the all-night rain Friday left the road particularly cool for Saturday.

Tires Not the Weak Links

Notwithstanding road and weather conditions it cannot be said that now tires are the weak links in racing and that

Trophy at Elgin, Saturday, August 21, Over the 8.38 Mile Road Course

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Table Showing Time for Each Lap of 301-Mile Race for the Chicago Auto

Car	Driver	Lap Distance	1 8 M. 2030 Ft.	2 16 M. 4060 Ft.	3 25 M. 6100 Ft.	4 33 M. 8140 Ft.	5 41 M. 10180 Ft.	6 50 M. 12220 Ft.	7 58 M. 14260 Ft.	8 67 M. 16300 Ft.	9 75 M. 18340 Ft.	10 83 M. 20380 Ft.	11 92 M. 22420 Ft.	12 100 M. 24460 Ft.	13 108 M. 26500 Ft.	14 117 M. 28540 Ft.	15 125 M. 30580 Ft.	16 134 M. 32620 Ft.
Stutz	Cooper	Elap. Time.	6:54	13:28	20:03	26:31	33:02	39:30	46:04	52:36	59:08	1:05:41	1:12:14	1:18:45	1:25:17	1:31:51	1:38:25	1:44:51
Stutz	Anderson	Lap Time	6:58	6:34	6:35	6:28	6:31	6:28	6:34	6:32	6:32	6:33	6:33	6:31	6:32	6:34	6:34	6:26
Delage	Oldfield	Elap. Time	7:27	15:07	22:36	29:21	36:03	42:51	49:41	56:30	1:03:14	1:10:00	1:16:47	1:23:48	1:30:37	1:37:11	1:43:51	1:50:27
Ogren	Alley	Lap Time	7:13	7:40	7:29	6:45	6:42	6:48	6:50	6:59	6:44	6:46	6:47	6:49	6:34	6:40	6:36	6:31
Duesenberg	O'Donnell	Elap. Time	7:24	14:38	21:44	28:51	35:57	42:57	49:57	56:53	1:03:55	1:10:51	1:17:47	1:24:47	1:31:44	1:38:39	1:45:23	1:52:07
DeChesneau	Brown	Lap Time	8:20	7:14	7:06	7:07	7:06	7:00	7:00	6:56	7:02	6:56	6:56	6:57	6:55	6:44	6:44	6:36
Mercedes	DePalma	Elap. Time	6:36	13:09	19:44	26:35	33:09	39:44	46:15	52:48	59:15	1:05:51	1:12:21	1:18:54	1:25:20	1:31:47	1:38:18	1:44:49
Duesenberg	Henderson	Lap Time	7:22	6:33	6:35	6:51	6:54	7:23	6:27	6:30	6:29	6:30	6:30	6:31	6:39	6:36	6:41	6:48
Cornelian	Justin	Elap. Time	21:23	1:16	1:26:43	1:42:14	1:58:21	2:15:37	2:32:08	2:48:32	3:04:59	3:21:28	3:37:58	3:54:27	4:10:56	4:27:25	4:43:54	5:00:23
		Lap Time		54:37	10:43	15:31	16:07	17:16	10:31	11:54	13:37	15:49	10:58	9:44	8:01	8:07	8:32	7:52

races are lost by them. The two Stutzes on both days traveled 1207.32 miles and made only one tire change. Take the four cars Anderson-Stutz, Cooper-Stutz, O'Donnell-Duesenberg and De Palma-Mercedes and only three tires were changed by all four in the two days of racing, totalling 2287 miles or one change for every 763 miles, a remarkable record as compared with a few years ago. Of these four cars all but O'Donnell used cords, the latter fabrics. All told only fourteen tires were changed on both days of racing with nine starters one day and twelve the next. Not a single front tire was changed.

Few Mechanical Troubles

For 602 miles of racing crowded into 2 days there were very few mechanical troubles yet Cooper's Stutz was the only car to go through both days without having to raise the hood or give a single thought to mechanical details, a phenomenal record and one that would indicate that the sixteen-valve construction has been well handled by the Stutz company; and further that the high-speed motor has finally

Fastest Laps Over 8.38-Mile Course in C. A. C. Trophy Race at Elgin

CAR	DRIVER	LAP	TIME	M.P.H
Stutz	Cooper	16	6:26	78.206
Stutz	Anderson	13	6:26	78.206
Mercedes	De Palma	7	6:27	77.955
Delage	Oldfield	16	6:36	76.227
Duesenberg	O'Donnell	15	6:44	74.721
Ogren	Alley	11	6:44	74.721
Duesenberg	Henderson	8	7:01	71.607
De Chesneau	Brown	15	8:01	62.754
Cornelian	Justin	7	10:31	47.836



Left—Gilbert Anderson, who won the Elgin national trophy race in his Stutz at 77.256 m.p.h. Right—His team mate, Earl Cooper, who captured the C. A. C. cup at 74.979 m.p.h.

taken its place as a reliable factor in racing in this country. Anderson made one stop of 2 min. the first day at the pits with what apparently was valve-spring troubles.

De Palma's Troubles

De Palma had his Mercedes out for the first time since it wrecked the crankcase at Indianapolis in May. Since then it has had a new crankcase, new pistons, new connecting-rods and new wristpins. The trouble of a broken rocker arm was due to a too thin section in one place. The second day he had difficulty with his car at high speeds, due to the shock absorbers being out of adjustment, the car not riding well.

O'Donnell's Duesenberg made but one stop for a loose accelerator spring. Chandler's Duesenberg stopped due to a back fire in the carbureter; and Henderson's Duesenberg had more serious troubles, first breaking a valve rocker on Friday and a timing gear case on Saturday.

Oldfield's Delage Not Tuned Up

Barney Oldfield's Delage with its valves opened and closed by cams, in short, positively-opened and positively-closed valves, is not yet tuned up properly but ran both days without a stop for mechanical troubles until the last lap on the second day. This is the only motor in this country using mechanically-closing valves, a construction which insures a definite valve opening at all speeds. It was first used a year ago in the French grand prize race.

Course Tests Cars

All of these troubles are minor ones, not concerned with the major problems of design involved in the leading questions of high-speed racing motors such as sixteen-valve motors, high-speed characteristics, lubrication, ignition or carburetion. A road race does not test the motor as severely as a speedway race in that there are two right-angled turns on the Elgin course, which mean momentary motor rest. On the other hand, these turns are good tests for the brakes and the constant curving of the course is a severe test for springs, running gear parts and steering gear and connections.

Management Excellent

Race management throughout was the best that could be desired. Soldiers guarded the entire 8.38 miles and spectators were kept back of the road fences and not allowed to cross the course at any point. Around the entire course was a series of telephone stations connected with the score board at the grandstand, this board showing by moving figures the course of each car around the route on every lap. Thus the grandstand could see when leaders changed places on any part of the course. The Chicago Automobile Club, which conducts the race for the Elgin Road Race Assn., managed the entire affair in a highly creditable manner. The news of the race was announced by a series of megaphones not only to the grandstands but all around the course, the information being furnished by telephone from the grandstand. Baled

Chicago Automobile Club Trophy at Elgin, Friday, August 20 on the 8.38 Mile Road Course

	16 34 M. 800 Ft.	17 142 M. 2830 Ft.	18 150 M. 4860 Ft.	19 159 M. 1610 Ft.	20 167 M. 3640 Ft.	21 176 M. 390 Ft.	22 184 M. 2420 Ft.	23 192 M. 4450 Ft.	24 201 M. 1200 Ft.	25 206 M. 3230 Ft.	26 217 M. 5260 Ft.	27 226 M. 20 0 Ft.	28 234 M. 4040 Ft.	29 243 M. 790 Ft.	30 251 M. 2820 Ft.	31 259 M. 4850 Ft.	32 268 M. 1600 Ft.	33 276 M. 3630 Ft.	34 85 M. 380 Ft.	35 293 M. 2410 Ft.	36 301 M. 4440 Ft.	Miles per Hour
44:51	1:51:20	1:57:57	2:04:32	2:11:04	2:18:25	2:25:02	2:31:43	2:38:19	2:45:03	2:51:49	2:58:42	3:05:35	3:12:27	3:19:22	3:26:10	3:32:58	3:41:02	3:47:47	3:54:42	4:01:32	74.979	
6:26	6:29	6:37	6:35	6:32	7:25	6:33	6:41	6:36	6:44	6:46	5:53	6:53	6:52	6:55	6:48	6:48	8:04	6:45	6:55	6:50		
44:49	1:51:25	1:57:54	2:04:21	2:11:27	2:18:05	2:24:37	2:31:17	2:37:51	2:47:02	2:54:16	3:01:23	3:08:35	3:15:41	3:22:54	3:29:56	3:37:04	3:44:08	3:51:10	3:58:08	4:05:04	73.859	
6:31	6:36	6:29	6:27	7:06	6:38	6:32	6:40	6:34	9:11	7:14	7:07	7:12	7:06	7:13	7:02	7:08	7:04	7:02	6:58	6:56		
50:27	1:57:14	2:04:00	2:10:45	2:17:33	2:24:25	2:31:18	2:38:15	2:45:02	2:51:54	2:58:52	3:05:48	3:13:43	3:21:30	3:28:29	3:35:34	3:42:19	3:49:16	3:56:03	4:03:02	4:09:55	72.467	
6:36	6:47	6:46	6:45	6:48	6:52	6:53	6:57	6:47	6:52	6:58	6:56	7:55	7:47	6:59	7:05	6:45	6:57	6:47	6:59	6:53		
51:29	1:58:19	2:05:14	2:12:04	2:19:05	2:25:51	2:32:29	2:39:31	2:46:19	2:53:07	3:02:15	3:09:10	3:16:52	3:23:54	3:30:42	3:37:42	3:44:36	3:51:39	3:58:06	4:06:05	4:14:29	71.163	
6:55	6:50	6:55	6:50	7:01	6:46	6:38	7:02	6:48	6:48	9:08	6:55	7:42	7:02	1:48	7:00	6:54	7:03	6:27	7:59	8:24		
52:07	1:58:43	2:05:48	2:12:25	2:19:32	2:26:28	2:33:24	2:40:20	2:47:17	2:54:28	3:04:00	3:11:14	3:18:32	3:25:39	3:32:40	3:39:42	3:46:47	3:53:56	4:01:07	4:08:12	4:15:40	70.836	
6:44	6:36	7:05	6:37	7:07	6:56	6:56	6:56	6:57	7:11	9:32	7:14	7:18	7:07	7:01	7:02	7:05	7:09	7:11	7:05	7:28		
13:13	2:22:29	2:36:55	2:45:41	2:54:01	3:02:33	3:10:51	3:19:49	3:30:07	3:42:15	Out, broken	connecting-rod	25th lap										
8:22	9:16	14:26	8:46	8:20	8:32	8:18	8:58	10:18	12:08													
03:20	3:09:59	3:16:40	3:23:30	3:30:05	3:37:26	Out 21 st lap																
6:48	6:39	6:41	6:50	6:35	7:21																	
26:14	2:34:22	2:42:17	2:50:17	2:57:38	4:36:22	4:54:18	Flagged															
7:52	8:08	7:55	8:00	7:21	1:48:44	7:56																

straw was used to protect the cars at the two right-angled turns in case they should skid.

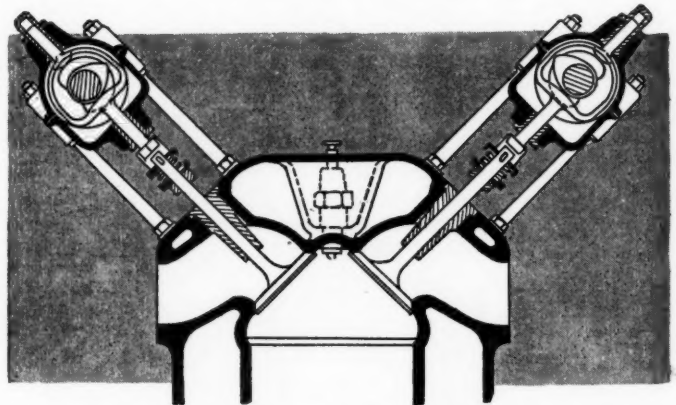
Weather Affects Attendance

Unfortunately, owing to the weather the attendance was much smaller than in former years, scarcely more than 25,000 witnessing Saturday's race. It rained all Friday night and was raining in Chicago, 38 miles away, nearly all day Saturday, thus preventing thousands from attending. The central west has had a wet season for the last three months. Because of this it is thought that the Elgin Road Race Assn., which manages the race, will be practically \$15,000 behind on both days. Cash prizes aggregating \$8,000 were given. The winner each day received \$2,000; second man \$650 and third \$350. Each car completing 100 miles received \$100 and those completing 200 miles \$200.

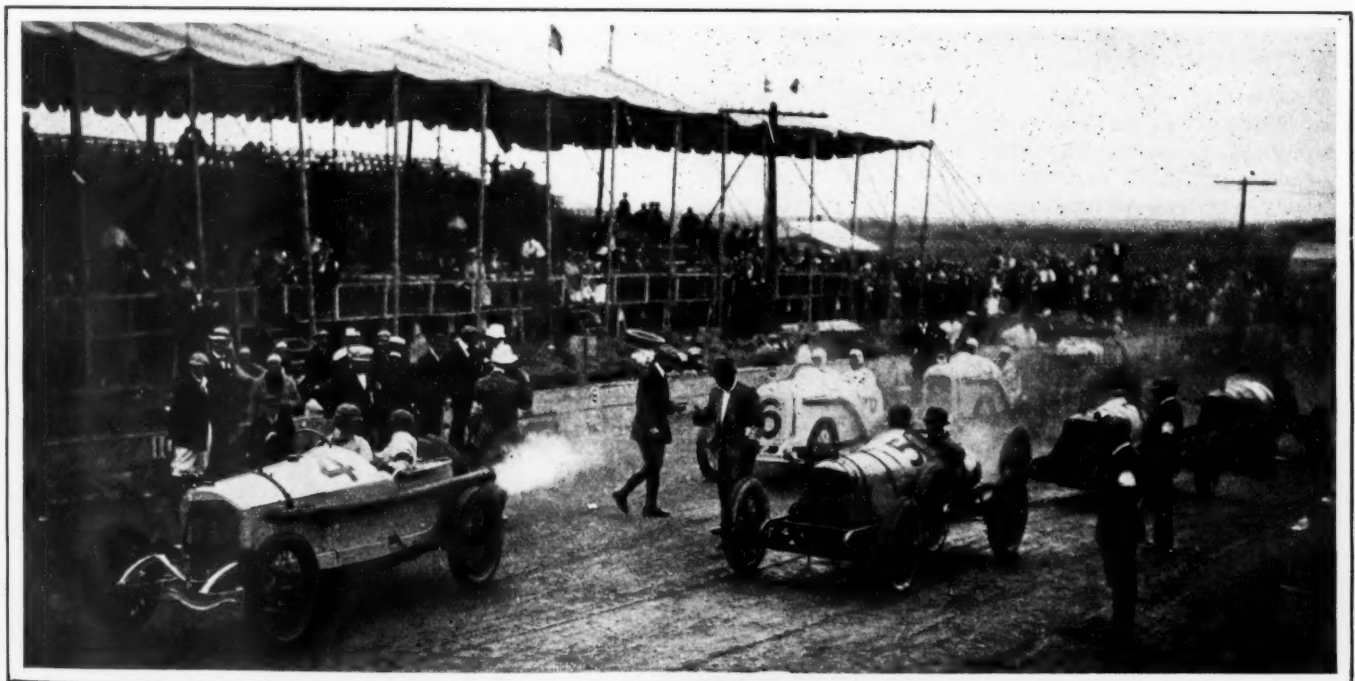
In the Way of Equipment

Both Cooper and Anderson used Bosch magnetos and plugs; O'Donnell used a Bosch magneto and Rajah plugs and Oldfield used a Mea magneto and Rajah plugs. Cooper and Anderson both had Stromberg carbureters, Oldfield used four Claudels and O'Donnell used Master on Saturday and a Schebler on Friday. Cooper and Anderson both rode on Houk wire wheels and Oldfield and O'Donnell rode on Rudge-Whitworths. All four used Hartford shock absorbers.

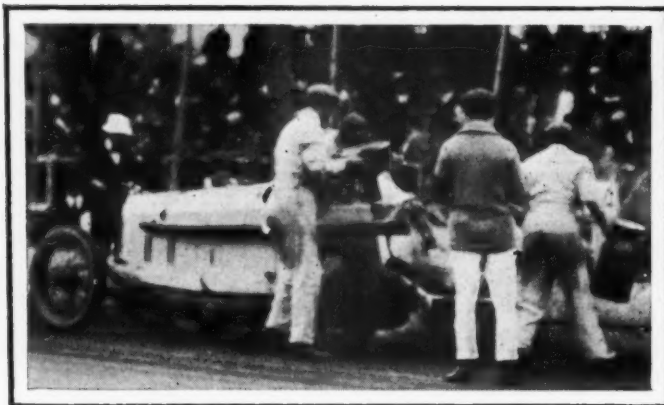
The Stutz cars driven by Cooper and Anderson had aluminum alloy pistons, while O'Donnell's Duesenberg used magnalium and Oldfield's Delage, steel. In the way of tire equipment the two Stutzes used Silvertown cords, O'Donnell used Riverside and Oldfield, Firestones. For lubrication Oil-zum was a favorite, being used by all four drivers mentioned as was Dixon's grease.



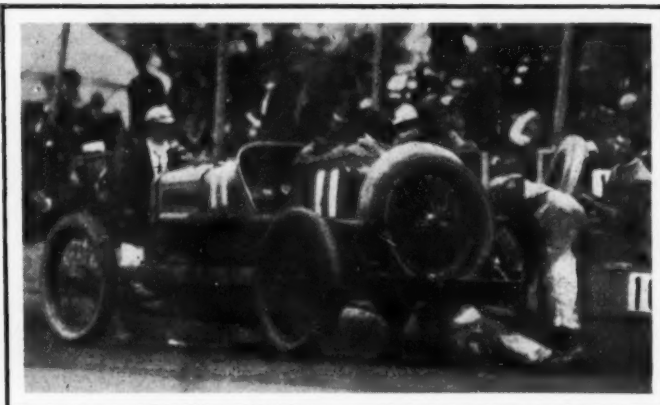
Detail of positively-operated valves in Oldfield's Delage. The valves are opened and closed by cams. The Elgin contest is the first road race in which this type of valve operation has appeared.



Start of the race for the Chicago Automobile Club trophy held on the Elgin road race course on Friday, August 20



De Palma makes a stop at the pits for gasoline and oil



Oldfield in for repairs. Note pit man under rear axle

Cord Tires Score in Road Racing

Anderson Goes Through Both Days on Same Set, Covering 603 Miles—Few Changes—Little Mechanical Trouble

ELGIN, ILL., ROAD RACE COURSE, Aug. 21—Cord tires invaded a new field in the C. A. C. and Elgin National classics to-day and yesterday when they had their first tryout in actual road racing. Anderson, Cooper, De Palma and Henning carried Silvertown cords and Robillard in the Lozier had a cord tire of Marathon make. Anderson, who finished first in the 450-in. event to-day and second in the 300-in. race of yesterday, rode on the same tires throughout both races though he had different cars. They looked as good at the end of the 603 miles of the two-day meet as they did at the beginning.

Cooper went through the two days with one tire change, which was caused by a horseshoe nail picked up Friday. De Palma likewise had a puncture which necessitated a tire change, but all of his casings looked good for double the distance; in fact, there is only one mark showing on De Palma's tires and this came from his vigorous braking when he overran the turn to-day.

Cars Better Balanced

Tires on the whole stood up very much better this year than they have in previous races. This cannot be credited entirely to the tires, for the course is so much smoother than it has been previously that less tire wear was to be expected. The day was cool, as has been the case in previous Elgin meets which would be accountable for less heating and consequently longer life of the tires. Another factor is that the cars, particularly the speedier ones, are better balanced each year so that they hold the road better and thus relieve the tires of added strain.

Friday's race saw only three tire changes, the two of De-Palma and Cooper already mentioned, one of Oldfield's who changed at the end of the first lap. The Saturday race was more prolific in tire trouble than was the Friday one. This was to be expected inasmuch as many of the tires were used on the second day that had gone through the first day's 301 miles. Also, the average speed was over 2 m.p.h. faster on Saturday, a difference that would make quite an appreciable lessening of tire life. Altogether there were eleven cars changed Saturday.

Not a Front Tire Changed

O'Donnell made a change on the back stretch, Oldfield replaced four, Robillard lost one by a blowout, Chandler

lost two, and Henderson in the Duesenberg lost three. It is worthy of note that not a front tire was changed at the pits during the two days' racing.

Delage Has Positively Operated Valves

Elgin was the first road race in which a positively-closed valve motor has been used. This is the Delage which Oldfield drove. It is unique in that there is no necessity for valve springs. A cam insures the opening of the valve, also the closing, a feature that makes it similar to the sleeve-valve engine, where the uncovering and covering of the ports is positive. With this arrangement it is possible to increase the speed of the engine as the valve spring is one of the limiting factors in motor speed in poppet-valve engines. There is a single overhead camshaft with eight pairs of cams and for each valve there is a three-arm rocker, one of which is connected direct to the stem valve and the two others are in contact, one with the opening and the other with the closing cam. This is illustrated on page 365.

Little Pit Work

There was an unusually small amount of pit work during this year's Elgin classic, but in a number of cases the troubles which brought the cars into the pits were of such

Specifications and Equipment of

Car	Driver	CYLINDERS		
		Cast	Bore and Stroke	Piston Displacement
Mercer	Patrick	Pairs	4.375x5	300.70
Cornelian	Justin	Block	2 7/8x4	106.50
DuChesneau	W. W. Brown	Single	3.26x5 1/2	184.00
Mercedes	De Palma	Single	3.661x6.47	272.1
Duesenberg	P. Henderson	Block	3.984x6	299.0
Stutz	Anderson	Block	3.812x6.5	296.8
Duesenberg	O'Donnell	Block	4.375x6	360.8
Stutz	Cooper	Block	3.984x6	299.0
Stutz		Block	3.812x6	296.8
Ogren	Alley	Block	3.812x6	296.8
Delage	Oldfield	Block	3.703x6.3	271.86
Duesenberg		Block	4.375x6.0	360.8
Lozier	Robillard	Block	3.259x6.625	220.8
Stutz	Burt	Pairs	5.1x5.5	450.7
Mercer	Henning	Block	3.75x6.75	298.2

*Saturday's race.

serious nature that they required rather unusually long stops, so that there was a car undergoing repairs of some sort most of the time.

To take up the troubles of the individual tires in the Chicago Automobile Cup race on Friday, we find that Cooper came into the pits on only two occasions, the first time when he halted for 21 1/5 sec. to take on gasoline and tightened up the shock absorbers. The second and last stop was when he changed a right rear tire which was punctured by a horse-shoe nail. This held him for 33 sec. so that the Californian's total time lost at the pits was less than 1 min.

Anderson, his team mate, likewise made but two stops. The first one was at 167 miles when he took on gasoline, getting away in 20 sec. After he had run over 200 miles he came into the pit missing on one cylinder. After looking at the ignition and valves Anderson started out without doing any work to remedy the trouble and finished on three cylinders in second place.

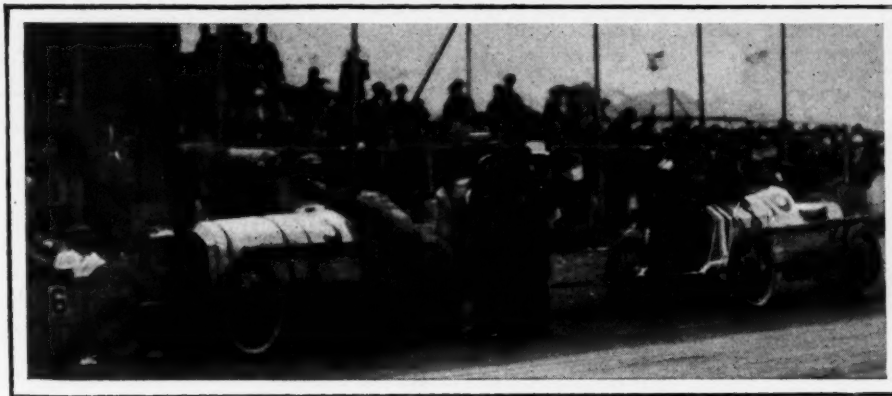
Eddie O'Donnell, in the Duesenberg, made only one stop and this was at the end of 206 miles when he took on fresh supplies of gasoline and water; at the same time he attached the accelerator spring which had become loose.

Oldfield First to Stop

Oldfield in his Delage made the first stop of the day, when he changed a right rear tire at the end of the first lap. He made a halt for gasoline and oil after running 217 miles.

De Palma made three stops and lost a total of 1 hr. and 15 min. before he finally retired with a broken rocker arm. When he first came in it was on three cylinders after he had run about 35 miles. The rocker was giving him trouble but after spending 5 min. and 30 sec. at the pit he got away without doing anything other than changing two spark plugs. The next lap, however, which took nearly 13 min., ended at the pits with the rocker arm broken and De Palma waited while a mechanic went to his garage in town after another rocker arm. By the time the new one was fitted 1 hr. and 9 min. had elapsed. De Palma, however, started out to finish 100 miles with a view to running-in the motor, which had new pistons and also to get some practice for the next day's event. He was out of the race to all intentions when his first trouble developed.

Henderson's Duesenberg was a contender until it came in with a stuck valve and broken valve spring and went out of the race.



In spite of the few mechanical troubles, the pit men had plenty to do. Some of the troubles which brought the cars to the pits required a long time to repair

Tom Alley also was running well and made only one stop while he took on supplies and changed a broken spark plug. Alley managed to put the Ogren into fourth place but finished on three cylinders, the other, missing on account of a broken rocker arm.

Cooper Had No Troubles

In Saturday's race, Cooper was shown to be the only one who was immune from mechanical troubles among the finishers of the two days' racing. Cooper went through the 603 miles of the two events without lifting the hood of his car. His only stop on the second day was in the twenty-second lap when he refilled the gasoline tank in preparation for his dash for the checkered flag. He did not spend much time at the pits, getting away 13 sec. after his wheels came to a standstill. His team mate, Anderson, also hesitated only once, this was a pause of 17 sec. while a gasoline can was upended over his tank.

O'Donnell lost a few seconds more, being held 36 sec. while he took on gasoline and oil in the twenty-fourth lap. De Palma lost 16 sec. in the twenty-third lap while he refilled his gasoline tank.

Oldfield made three stops, changing four tires altogether. The first one was in the fifth lap when he changed the left rear, the second he changed the right rear and took on gasoline and oil, and the last time he put on some Pirelli tires which had studded treads.

In the 2-days racing at Elgin in 1914 there were eighty-eight pit stops, forty-seven of these being made on Friday during the Chicago Automobile Club cup race and forty-one on Saturday in the Elgin trophy contest. It was remarked at the time that there were but sixteen stops for tires on the first day and but seventeen on the second.

Cars in the 2-Day Road Races at Elgin, Ill., on Friday and Saturday, August 20 and 21

VALVES					Lubri- cation †	Oil	Grease	Magneto	SPARK PLUGS		Carbu- reter	MAIN BEAR'GS		PISTONS		W.B.	Wheels	Tires	Shock Absorb- ers
No.	Ar'ge- ment	How Operated	Diam- eter	Lift					No.	Make		No.	Kind	Mat'e- rial	No. Rings				
8	T-hd...	Push rods...	2 1/4	9/16	Splash...		Havoline	Bosch...	..	Split..	Rayfield...	3	Plain	Iron...	2	106	Houk...	Firestone..	Hartf.
8	In hd...	Push rods...	1 3/4	...	Splash...	Texaco	Dixon...	Atw. Kent...	..	Bosch.	Master...	2	Plain	Magnal...	2	100	Own...	Goodyear...	...
16	In hd...	Ovhd camshft.	...	...	Force...	Mobile	...	Bosch...	8	Rex...	Rayfield...	5	Plain	Magnal...	2	...	R. W...	Qualityre...	Hartf.
16	In hd...	Ovhd camshft.	1 3/4	.3937	Force...	Monogram	...	2 Bosch...	16	Eisem.	Packard...	5	Plain	Lynite...	4	112	R. W...	Silvertown.	Merced.
8	Side hd.	Vert. rockers...	2 1/4	7/16	F. & S.	Oilzum...	Dixon...	Bosch...	..	Rajah.	Schebler...	2	Plain	Magnal...	3 in 1	106	R. W...	Riverside...	Hartf.
16	In hd...	Ovhd camshft.	...	...	F. & S.	Oilzum...	Dixon...	Bosch...	..	Bosch.	Strom...	3	Ball...	Al. Alloy...	2 in 1	102	Houk...	Silvertown.	Hartf.
8	Side hd.	Vert. rockers...	2 1/4	7/16	F. & S.	Oilzum...	Dixon...	Bosch...	..	Rajah.	*Master Schebler	2	Plain	Magnal...	3 in 1	106	R. W...	Riverside...	Hartf.
16	In hd...	Single ovhd...	...	...	F. & S.	Oilzum...	Dixon...	Bosch...	..	Bosch.	Strom...	3	Ball...	Al. Alloy...	2 in 1	102	Houk...	Silvertown.	Hartf.
16	In hd...	Single ovhd...	...	...	F. & S.	Oilzum...	Dixon...	Bosch...	..	Bosch.	Strom...	3	Ball...	Al. Alloy...	2 in 1	102	Houk...	Silvertown.	Hartf.
8	Side hd.	Vert. rockers...	2 1/4	7/16	F. & S.	Oilzum...	Dixon...	Bosch...	8	Bosch.	Rayfield...	2	Plain	Magnal...	3 in 1	...	Houk...	Nassau...	Hartf.
16	In hd...	2 ovhd camshs.	1 31/32	.4724	Force...	Oilzum...	Dixon...	Mea...	..	Rajah.	4 Claudel.	5	Ball...	Steel...	2	104	R. W...	Firestone...	Hartf.
8	Side hd.	Vert. rockers...	2 1/4	7/16	F. & S.	Oilzum...	Dixon...	Bosch ZR4.	..	Rajah.	Scheb. L.	2	Plain	Magnal...	3 in 1	106	R. W...	Riverside...	Hartf.
8	Side...	Push rods...	...	...	Splash...	Castor...	...	*Rajah Bosch	4	...	Rayfield...	3	Plain	Iron...	2	...	Wood...	Mara. Cord	Hartf.
8	Side hd.	Push rods...	3	1/2	Force...	Veedol...	Dixon...	Split. DD.	8	Bosch.	Strom. H.	3	Plain	Iron...	2	101	Houk...	Nassau...	Hartf.
8	Side...	Push rods...	2 1/4	7/16	Force...	Castor...	Dixon...	Bosch ZR4.	8	Bosch.	Rayf. AA.	3	Plain	Steel...	2	108	R. W...	Silvertown.	Hartf.

† F. & S.—Force and splash.

Brass and Bronze—Offsprings of Copper—Part II

Nine Alloying Substances Added to Copper-Tin and Copper-Zinc Alloys for Special Purposes—Lead, Manganese and Phosphor Especially Important

By J. Edward Schipper

BRONZE and brass are the two major members of the family of copper alloys. Zinc and copper as has been pointed out form brass. Tin and copper form zinc, thus zinc and tin are the two leading alloying substances of the non-ferrous family. The qualities of these have been shown, but besides these great leaders in the non-ferrous family there are many other members which have important relations to the qualities of the alloys of which they form a part. Copper is the mother metal and brass and bronze the two leading offsprings, but besides these there are many others which are modified by the use of additional alloying substances and which merit attention in the study of the make-up of the non-ferrous family.

Before leaving zinc a word to summarize what it does with copper in the composition of brass may be of use. In the first place it is generally accepted that brass is a mixture and not a compound. The addition of the zinc gives to copper, which is proverbially one of the hardest metals on earth on tools, the quality of being readily worked. In fact yellow brass is so readily worked while cold that thousands of pieces an hour are turned out on fast machinery without any lubrication of the cutting tools. Many articles are made under a drop hammer while cold, and brass is even rolled while in that state. An interesting method of working brass which is rendered possible by the zinc is spinning. A tool pressed against a rapidly rotating or spinning piece of brass gives it an entirely new shape and it can be burnished to take a fine polish by the pressure and friction of a smooth steel tool.

Kalchoids—The Connecting Branch

So far the non-ferrous family has been divided into two separate branches, the bronze on one side including the alloys of copper and tin and the brass on the other composed of the alloys of copper and zinc. These are the two distinct offsprings of the mother metal copper, but between them there is another class which forms the connecting link between the brass and bronze being composed of copper and both tin and zinc. These are known as the Kalchoids. By varying the content of copper, tin and zinc, an endless number of permutations and combinations are possible, but the metals between certain zones of content have characteristics which are of immense value. The alloys in this class include the strongest and hardest combinations which can be effected with copper as a base. At the same time, ornamental metals can be made from different combinations, an imitation gold being produced with a copper percentage of 81.5, zinc 18 and tin .5. Another ornamental metal which is used for decorating small fire arms, etc., is composed of copper 80, zinc 17 and tin 3. Medals, brass buttons, and an endless variety of other useful articles are made from the Kalchoids which have been christened thus after the Greek Kalchos.

Metals known as white brass, and government bronze, and

several other metals in common use, belong to this classification of copper-tin-zinc metals. They can be varied to such a great extent and furnish such a large number of possible metals that the field of experimentation has always been of interest. It is said that Sir F. Chantrey actually formed a razor blade as hard as tempered steel from a metal composed of 76 per cent copper, 12 tin and 12 zinc. Some idea of the way the copper-tin-zinc alloys vary can be had from the accompanying table given by Thurston, page 370.

Nine Important Alloying Metals

Copper, tin and zinc are the three leaders in the non-ferrous family, but they are not the only members which con-

Ancient Bronzes, Brasses and Kalchoids

	Date	Copper	Zinc	Tin	Lead	Iron
Large brass of the Cassia family	B.C. 20	82.26	17.31	..	..	.35
Large brass of the Nero family	A.D. 60	81.07	17.81	1.05	..	..
Large brass of the Titus family	A.D. 79	83.04	15.84	..	..	.50
Large brass of the Hadrian family	A.D. 120	85.67	10.85	1.14	1.73	.74
Large brass of the Faustina family	A.D. 165	79.14	6.27	4.97	9.18	.23

Thurston Matls. of Engrg.

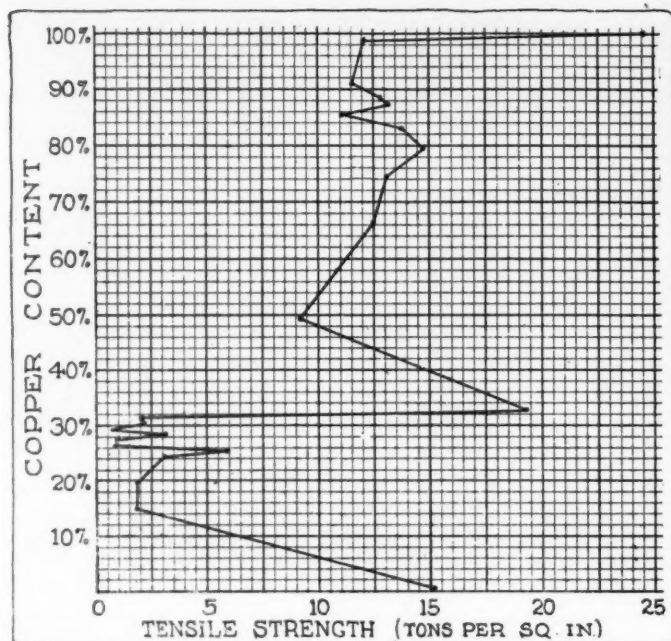
Composition of Non-Ferrous Relics

	Copper	Tin	Lead	Iron	Cobalt	Analyst.
1—Chisel, from ancient Egyptian quarry...	94.00	5.90	.....	.10	.....	Wilkenson
2—Bowl, from Nimroud	89.57	10.43	.....	...	.....	Dr. Percy
3—Bronze overlaying iron	88.37	11.33	...	..	.....	Dr. Percy
4—Sword-blade, Chertsey, Thames	89.69	9.58	...	.33	.....	J. A. Phillips
5—Axe-head	88.05	11.12	.78	..	.....	Prof. Wilson
6—Celt	81.19	18.31	.78	..	.....	Prof. Wilson
7—Roman Ax, B.C. 500	69.69	7.16	21.82	.47	.57	J. A. Phillips
8—Julius Caesar	79.13	8.00	12.81	..	.....	J. A. Phillips

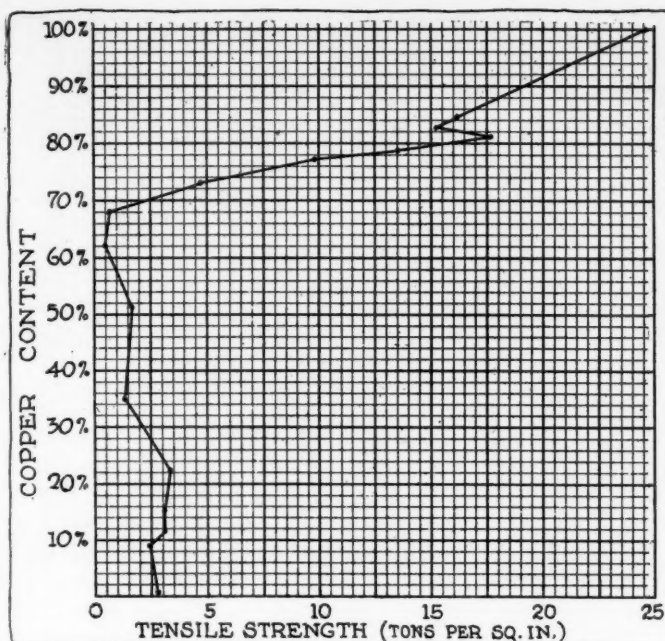
Thurston Matls. of Engrg.

Physical Specifications of Cast Phosphor-Bronze

Reduction of Section, per Cent	Elastic Limit		Ultimate Resistance	
	Per Sq. Mm.	Per Sq. In.	Per Sq. Mm.	Per Sq. In.
8.4	16.05 Kil.	10.6 T.	37.0	23.5 T.
1.5	17.38	11.05	32.5	20.6
33.4	11.6	7.2	31.3	19.9



Tensile strengths of copper-zinc alloys with different percentages of copper content as plotted from a tabulation of tests



Tensile strength of copper-tin bronzes for varying copper content from a tabulation of tensile strengths of samples

tribute their share to the bewildering variety of combinations possible. In fact, what can be done with the three alone has only been touched upon lightly. The tabulations which are given in connection with these three alloys do little more than scratch the surface of a possibility. But there are other relatives in this great family which have their influence and perform certain duties for specific purposes and some of these which are of great importance such as lead, antimony, manganese, phosphor, aluminum, nickel, bismuth, silicon, and iron have marked effects which render them of value.

Lead when used on the brass branch of the non-ferrous family tree is found in the metals which are desired for easy working. Thus lead is found in yellow brass, sheet brass, low, brazing, red, gilding, coldworking, free-cutting and other brasses where easy working is desired. On the bronze side, the lead is found in the metals which are used for bearing purposes. It is mixed with copper and tin to form so-called babbitt and is included in the formula for phosphor bronze.

These are soft and hard bearing materials which are used in connection with steel shafting and where it is desired to have a non-abrasive and good friction quality of bearing material.

Lead a Softener

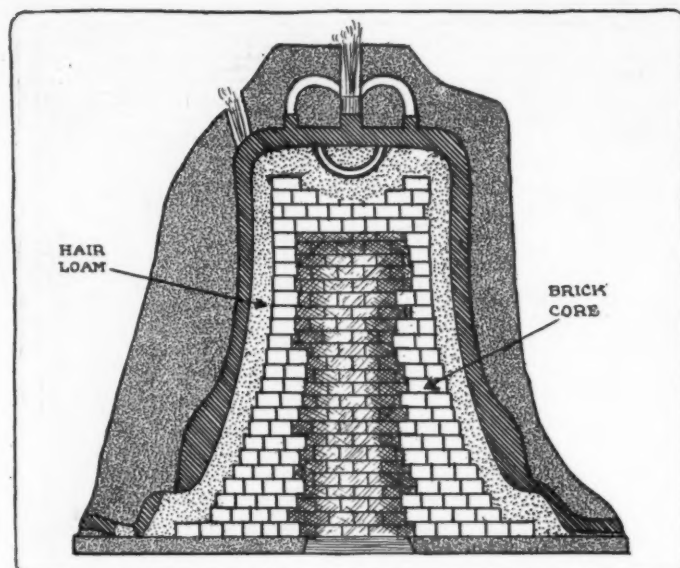
The qualities of lead give a ready clue to what it might be expected to do with other metals. It melts at about 625 deg. Fahr. becoming soft and pasty at about 617 deg. It has a specific gravity of 11.25 and a tensile strength of 1600 to 2400 lb. per square inch. It has very little elasticity and flows under a slight strain. In structure it is crystalline as will be noted by the fracture on breaking. When added to a copper-zinc alloy it allows the resulting material to be readily cut, but it cannot be added blindly as when present in certain quantities the metal becomes difficult to handle. For instance, when added up to as high as 10 per cent with copper 60 and zinc 30 it is difficult to obtain a homogeneous mixture. This is shown by the fact that the metals crack and segregate

Properties of Copper-Zinc Alloys

At. Comp.		Copper by Anal. per Ct.	Sp. Gr.	Color	Fracture	Tenacity, Tons per Sq. In.	ORDER OF		
							Mall.	Hard.	Fus.
Cu	Zn								
1	0	100.00	8.667	Red	.....	24.6	8	22	15
10	1	98.80	8.605	Red-yellow	Coarse	12.1	6	21	14
9	1	90.72	8.607	Red-yellow	Fine	11.5	4	20	13
8	1	88.60	8.633	Red-yellow	Fine	12.8	2	19	12
7	1	87.30	8.507	Red-yellow	Fine	13.2	0	18	11
6	1	85.40	8.591	Yellow-red	Fine fibre	11.1	5	17	10
5	1	83.02	8.415	Yellow-red	Fine fibre	13.7	11	16	9
4	1	79.65	8.448	Yellow-red	Fine fibre	14.7	7	15	8
3	1	74.58	8.397	Pale yellow	Fine fibre	13.1	10	14	7
2	1	66.18	8.299	Deep yellow	Fine fibre	12.5	3	23	6
1	1	49.47	8.230	Deep yellow	Coarse	9.2	12	12	6
1	2	32.85	8.263	Dark yellow	Coarse	19.3	1	10	6
8	17	31.52	7.721	Silver white	Coarse	2.1	*Very brittle	5	5
8	18	30.36	7.836	Silver white	Coarse	2.2	Very brittle	6	5
8	19	29.17	7.019	Light gray	Coarse	0.7	Very brittle	7	5
8	20	28.12	7.603	Ash gray	Vitreous	3.2	Brittle	3	5
8	21	27.10	8.058	Light gray	Coarse	0.9	Brittle	9	5
8	22	26.24	7.882	Light gray	Coarse	0.8	Brittle	1	5
8	23	25.39	7.443	Ash gray	Fine	5.9	*Slightly ductile	1	5
1	3	24.50	7.449	Ash gray	Fine	3.1	Brittle	2	4
1	4	19.65	7.371	Ash gray	Fine	1.9	Brittle	4	3
1	5	16.36	6.605	Dark gray	Fine	1.8	Brittle	11	2
0	1	0.00	6.895	.....	.....	15.2	.....	23	1

*Very brittle, and slightly ductile.
In the above table, the minimum of hardness and fusibility is denoted by 1.

Thurston's Matls. of Engrg.



Arranging for the casting of a huge bell, one of the time-honored uses for bronze

on rolling. With lead 2.5, zinc 37.5 and copper 60, the cutting qualities are excellent, but the material can only be hot-rolled and forged with difficulty.

In a word, lead is the softening element. It lends the qualities of mildness to the alloys of which it forms a part. Having a nature that can almost be classified as plastic, it lends this quality to the metals with which it is mixed. When mixed alone with copper, as it is in some type metals, it is more or less unstable and will separate readily. When in combination with copper and tin or, in other words, when forming part of a bronze it forgets its plastic disposition and makes the bronze durable and capable of resisting wear. Some of the white metals for bearings contain anywhere between 0 and 80 per cent lead although the original babbitt does not contain any. It is however, an ingredient in many of the main bearing materials in automobile work.

Antimony a Hardener

Antimony finds its best uses on the bronze side of the non-ferrous family. Here it is of particular value due to its hardening influence on tin. In itself it is a brittle, bluish white metal with a laminated structure having a specific gravity of 6.8 and melting at 842 deg. Fahr. Having the hardening influence on tin it is of great value in the bearing metals and in fact was one of the constituents of the original babbitt which was com-

Properties of Copper-Tin-Zinc Alloys

No.	Copper	Tin	Zinc	Remarks
1	100	100	100	Very white, brittle, subject to liquidation.
2	100	50	50	Very white, but finer grain.
3	100	25	50	Yellowish tint, hard, fine not malleable.
4	100	25	25	Brittle.
5	100	20	20	Brittle, hard, yellow.
6	100	16	16	Brittle, hard, yellow, close grained.
7	100	14	14	Yellow, slightly malleable.
8	100	12.5	12.5	Yellow, more malleable.
9	100	11	11	Yellow, more malleable.
10	100	10	10	Fine yellow, fine grain, malleable.
11	100	8	8	Yellow, softer, more malleable.
12	100	7	7	Golden, malleable, soft.
13	100	6	6	Golden, malleable, soft.

Thurston Matls. of Engrg.

posed of copper, tin and antimony. In bearing metals it is most frequently used between 4 and 6 per cent. According to most authorities the good influence of antimony ceases when it is used in the proportion of about 18 per cent and above this it should not be employed.

Like other members of the non-ferrous family antimony is of ancient lineage being known to the early Greeks and being referred to in the Old Testament. It has always been of value as a hardening agent and forms a part of the metal used in the making of printing types. It is of great value in this as it imparts to the metal the quality of expansion upon solidification thus permitting of a sharp impression of the mold.

Phosphorus a Bronze Tonic

Phosphorus, the poison of steel, is a veritable tonic when added to bronze. The introduction of this member into the family lends a strength and purity to what may be called the heavy duty bronzes that could never be reached without it. Phosphor bronze has been used for many years and in it the phosphorus acts as a flux increasing the purity by acting as such and furthermore lending its friendly offices in the closer amalgamation of the tin and copper. By adding small proportions of phosphorus to copper in the form of a phosphoret of copper or tin, the oxides of copper which are generally present as an impurity are removed by deoxidization, with the result that the grain of the resulting alloy is much finer.

(To be continued)

Properties of Copper-Tin Alloys*

At. wt.: Cu. = 31.6; Sn = 58.9

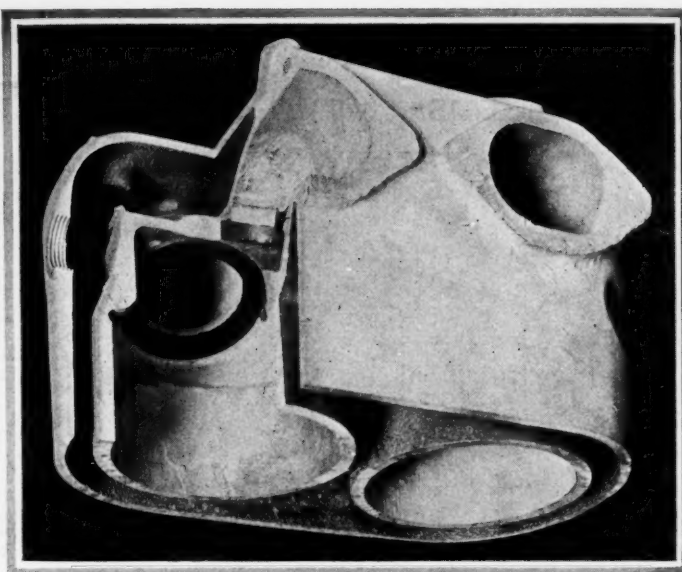
At. Comp.	Copper per Ct.	S. Gr.	Color	Fracture	Tenacity, Tons per Sq. In.	ORDER OF		
						Mall.	Hard.	Fus.
Cu 100	100.0	8.607	Red-yellow	.....	24.6	1	10	16
a 10 0	84.29	8.561	Red-yellow	Fine grain	16.1	2	8	15
b 9 1	82.81	8.462	Yellow red	Fine grain	15.2	3	5	14
c 8 2	81.10	8.459	Yellow-red	Fine grain	17.7	4	4	13
d 7 3	78.97	8.723	Pale red	Vitreous	13.6	5	3	12
e 6 4	76.29	8.750	Pale red	Vitreous	9.7	Brittle	2	11
f 5 5	72.80	8.575	Ash gray	Conchoid	4.9	Brittle	1	10
g 4 6	68.21	8.400	Dark gray	Conchoid	0.7	Friable	6	9
h 3 7	61.69	8.539	White gray	Conchoid	0.5	Friable	7	8
i 2 8	51.75	8.416	White	Lam. grain	1.7	Brittle	9	7
j 1 9	34.92	8.056	White	Vitreous	1.4	Brittle	11	6
k 1 10	21.15	7.387	White	Lam. grain	3.9	Brittle	12	5
l 1 11	15.17	7.447	White	Lam. grain	3.1	8 Tough	13	4
m 1 12	11.82	7.472	White	Lam. grain	3.1	6 Tough	14	3
n 1 13	9.68	7.442	White	Earthy	2.5	7	15	2
o 0 14	.....	7.291	White	.....	2.7	.....	16	1

a, b, c, are gun-metals; d, hard brass for pins; e, f, g, h, i, bell-metal; j, k, for small bells; l, m, n, o, are speculum alloys.

*Dingler's Journal, lxxxv., p. 378; Watts's Dict. ii., p. 43.



Sawn-up section of large aluminum motor for aeroplane work. The dark rings are the cast iron valve seats which were given a thin coat of copper before making the casting so that the aluminum and iron have become almost welded together



Another view of the section shown at the left of the accompanying illustration, showing uniform thickness of the walls of the casting both as regards the main bores and the jacket. The iron ring has a dove-tailed circumference

Aluminum Aeroplane Motor Casting

Close Contact Between Cast Iron Valve Seat Rings and Aluminum Body Shown in Sawn-Up Cylinders

A VERY large aluminum motor for aeroplane propulsion is about to be tried out by one of the leading engine manufacturers and the photograph hereunder shows the method of construction. There are to be two valves per cylinder, arranged in the head and operated, apparently, from long push rods.

The first casting made has been cut up in order to see how the cores had stood up and the remarkably interesting thing about it is the extraordinary close contact between the cast iron rings which will form the valve seats and the aluminum which retains them in place. Each ring is cut with a dove-

tailed circumference and there are a few notches to guard against any tendency the ring might have to revolve while being machined. Before making the casting the iron rings are given a thin coat of copper and the sawn-up casting shows that the aluminum and iron have become almost welded together.

In examining the castings which are in pair form, it seems absurd to be able to pick up the block with one hand for the bore is about 5 in. and the stroke a good deal more than this. Very even thickness of wall is another striking feature of this casting, both as regards the main bores and the jacket.

Why Aluminum Means Economy

SIDNEY, OHIO.—Editor THE AUTOMOBILE:—The problem of eliminating weight in automobile construction is being considered very seriously. A number of engineers have already adopted the use of aluminum alloy to cut down weight. Pistons of this material are being used very successfully and cylinders should also be used of the same material.

If a motor $3\frac{3}{4}$ by 4 or $4\frac{1}{2}$ was constructed of aluminum alloy instead of the present material used in some motors, it would cut down the weight 75 lb., which would mean about $3\frac{3}{4}$ hp. more efficiency. Figuring that there are now 3,000,000 in use, it would make 11,002,050 lb. of unnecessary weight to be carried around, also figuring labor, machine work and cost of handling, the extra 75 lb. weight at 7 cents per pound would mean a loss to manufacturers of \$787,500, besides a great many thousand dollars' worth of tires needed to carry this weight.

It is surprising to see how fast automobile engineers are progressing. Only a few years ago there were no motors built under a 4 by 4 and up. The speed of these cars would

be about 32 to 40 miles per hour, and they would do about 16 miles on a gallon of gasoline. There are motors $2\frac{3}{4}$ by $4\frac{1}{2}$ that are able to make 35 to 45 miles per hour and 20 to 22 miles on a gallon of gasoline, in a car weighing 1700 to 1800 lb.

If we continue to progress in the future as in the past a great deal will be accomplished.—GEO. BAILEY, Superintendent Automobile Department, Bimel Buggy Co.

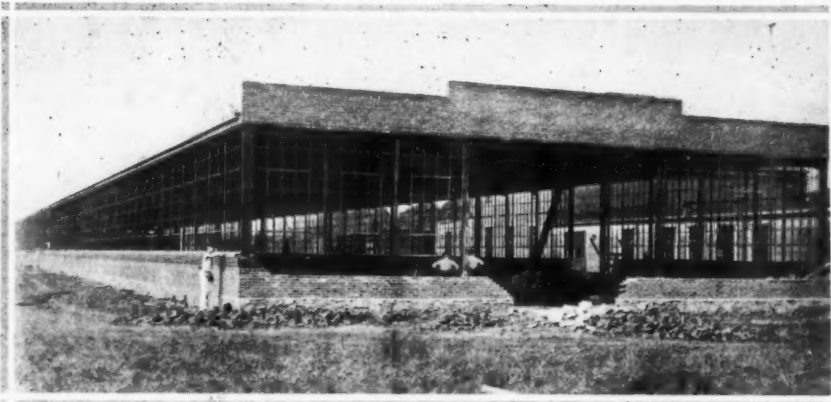
Automobiles for Scout Work in War

REPORTS from the battle front in Europe are to the effect that while aeroplanes are greatly used for scout work, automobiles are even more extensively employed in this capacity. Often these cars are equipped with portable stands which permit their occupants to elevate themselves to a considerable height above the surrounding territory and thus secure a wider horizon for their reconnaissance. Frequently the cars are driven into clumps of bushes or trees, which serve to screen the observers while at their work.

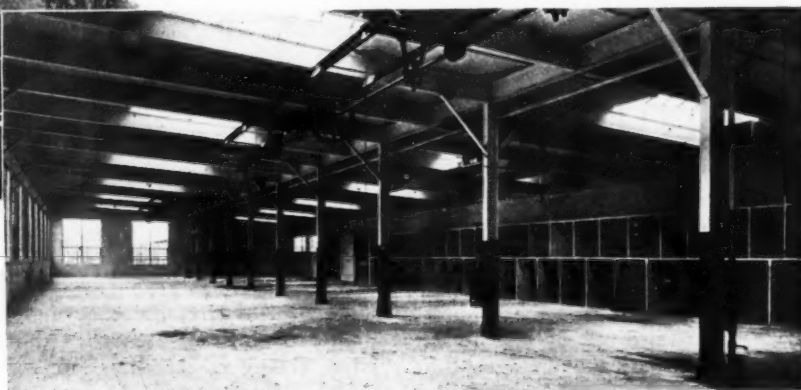
Three Factory Additions—Building a Speedway



Above — Five-story addition to the factory of the Federal Rubber Mfg. Co., Cudahy, Wis. The new building will add 50,000 sq. ft. to the manufacturing facilities of the Federal company. Most of this space will be devoted to the manufacture of automobile casings



The building illustrated above is the most recent addition to the factory of the Mercer Automobile Co., Trenton, N. J. This structure, which is of steel and glass construction, is now rapidly nearing completion and when it is finished will be used to house the paint and final assembly departments. The building measures 60 by 400 ft. and is one story in height, giving 24,000 sq. ft. of additional floorspace to the Mercer plant



New assembly department of the Russel Motor Axle Co., North Detroit, Mich. This is 60 by 192 ft. and adds 11,000 sq. ft. to the Russel factory's floor space. The axles to be assembled in this building will be largely those of the internal gear drive type. This structure is designed to form one-half of a building which, when completed, will be 120 ft. wide. It is planned to complete this before the end of the year



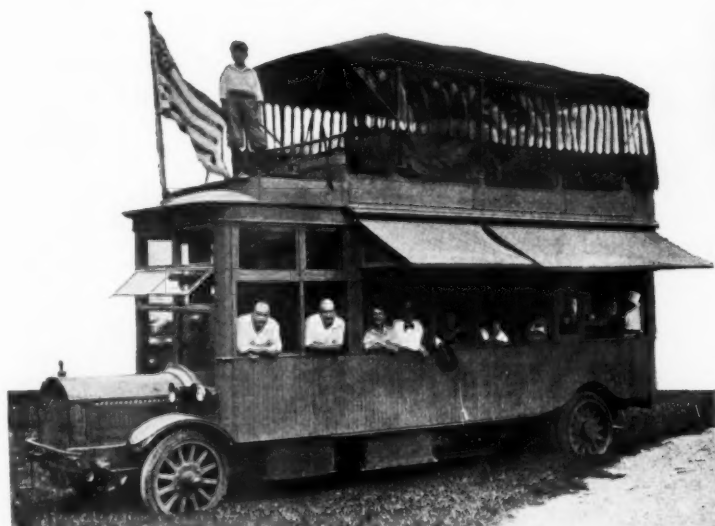
Building the Twin City Motor Speedway. The illustration shows how the work of excavation and the grading and surfacing of the track are being carried on at the same time to facilitate the completion of the course. Note the grandstands under construction and nearly completed in the background. This course is near Minneapolis and St. Paul, Minn.

Dodge Bros. Artificial Test Hill, Sand Pit and Speedway

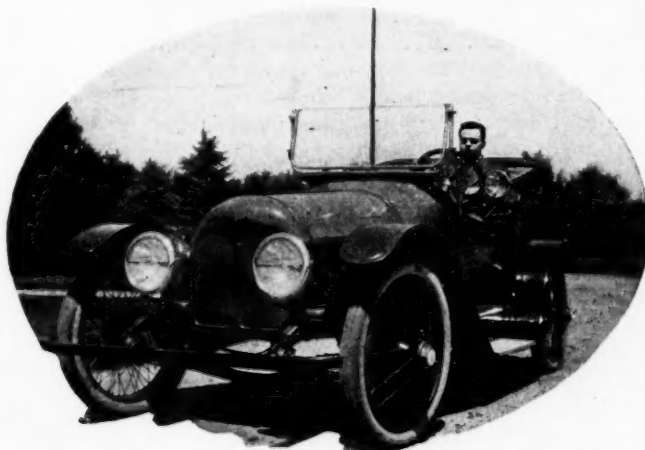


Dodge Bros., Detroit, Mich., have completed a $\frac{1}{2}$ -mile speedway, test hill and sand pit on the factory grounds for the purpose of keeping their test men off the public streets and roads. The hill is 542 ft. long by 30 ft. wide and has two approaches with varying grades. Over 215,000 ft. of lumber is used in the track, on which no pedestrians are allowed

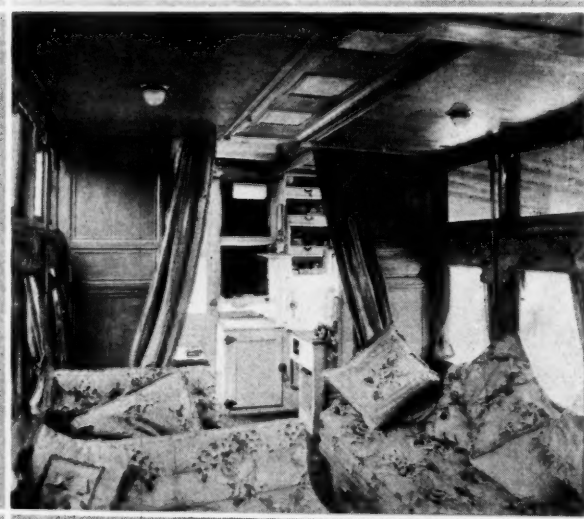
Automobile Land Yacht on Way to Coast



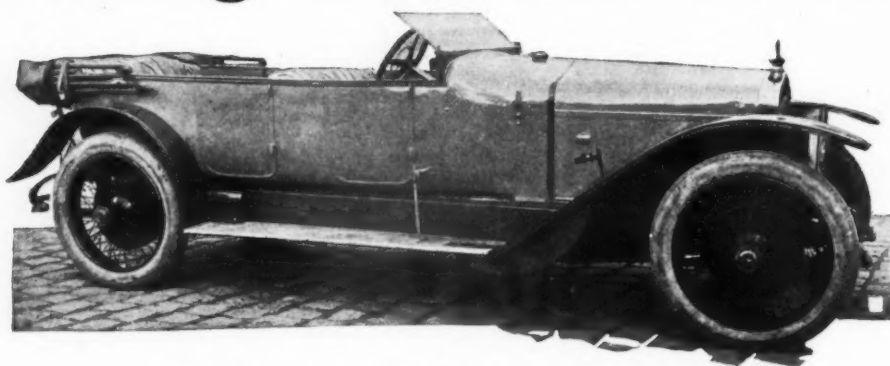
The above illustration shows the automobile land yacht, as its owner terms it, built for Roland R. Conklin of New York and Huntington, L. I., which left last week on its way to San Francisco. As president of the New York Motor Bus Co., Mr. Conklin developed the idea of constructing such a body and mounting it on an omnibus type chassis fitted with a 60 hp. motor. The machine, which is fitted with every conceivable convenience, is divided into three compartments; the forward one 5 ft. long containing the driver's seat, tank and crew's berths; the center compartment, illustrated at the right, is 10 ft. long and contains a bed-couch, two armchairs convertible into a bed and four berths which raise up to the ceiling when not in use; the kitchen is in the rear. Inside dimensions of the body are 21 ft. length, $7\frac{1}{2}$ ft. width, and $6\frac{1}{2}$ ft. height. Floors are of cork and a double gearbox giving nine speeds forward and three reverse is used



One of the new Beardsley electric roadsters manufactured in Los Angeles, Cal., which is claimed to do better than 30 m.p.h. and to be good for 85 to 100 miles per charge



Racing Influence in Delage Design



Delage 16-hp. six-cylinder car brought out in war times

New Six-Cylinder, 16-H.P.
Has Front Wheel
Brakes
Double Carbureter
and Exhaust
Unusual Manifold

RACING experience has been very largely drawn on in the design and construction of the new six-cylinder 16-hp. Delage. The new model has been completed during the war period, and such arrangements have been made that as soon as hostilities come to a close the car will be manufactured in big series. At the present moment Delage, like all other European automobile manufacturers, is so occupied with war material that it is impossible to produce big quantities of touring cars. The car is the work of engineers who have made all the Delage racing cars for the last seven years. The object has been to embody all the lessons learned with small, high-efficiency motors, and at the same time produce a car of simple design capable of being handled efficiently by the ordinary motorist.

48 Hp. at 1800 R.P.M.

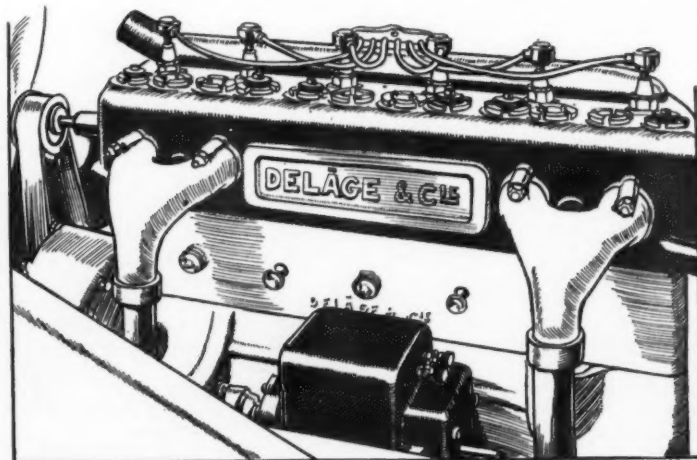
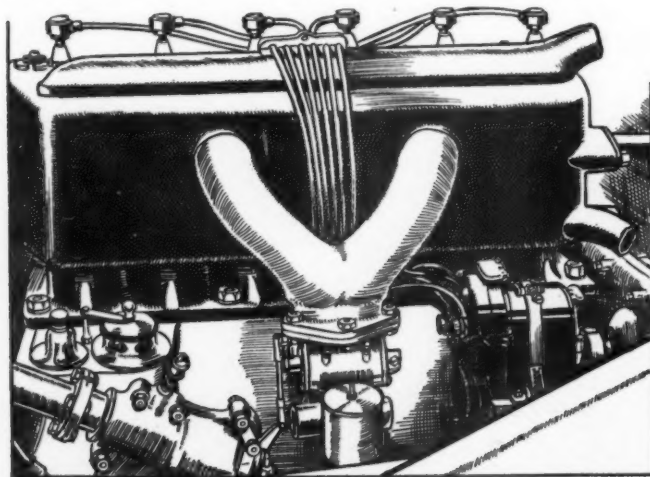
The cylinders measure 75 by 150 mm., 2.9 by 5.9 in. bore and stroke, giving a cubic capacity of 244 in. At 1800 revolutions the horsepower is 48; at 2100 revolutions 55 hp. is obtained. With a total weight of 4100 lb., the load being equivalent to an ordinary touring body and six passengers, the car has been tested to give an average of 68.9 m.p.h. over the measured kilometer. The tests were made over a 3-mile stretch of ordinary road, the run being made in both directions and the average taken, thus eliminating any advantage which may have accrued from wind or gradient. Fully equipped with touring body, spare wheel, windshield, fenders, headlights, top, and carrying five passengers, a test run of 140 miles was made at an average speed of 46.6 m.p.h. A similar test over more hilly country showed an average of 43 m.p.h. over a distance of 125 miles. These tests were

made under ordinary touring conditions, on French roads, no allowance being made for examination of passes by military guards, grade crossings, or the passage through villages.

Externally the motor follows standard design, being a block casting with inclosed valves on one side. To get the best form of combustion chamber the valve stems are inclined outward, and the valve pocket is placed close up to the cylinder barrel. The crankshaft is carried in four plain bearings; pistons are steel forgings, unusually light, and fitted with two rings. Connecting-rods are I-section, machined over all. These cars are to be supplied complete with electric lighting and electric self-starting equipment. The electric generator is carried between the crankcase hangers, on left-hand side of motor, but sufficiently low not to interfere with accessibility of valve springs. The high-tension magneto and water pump are on the opposite side, the pump being ahead of the timing gear housing and the magneto to the rear of it. Non-adjustable silent chains are used for driving camshaft, magneto and generator. The electric motor is under the floorboards, engaging with external gear cut on flywheel.

Unusual Exhaust Manifold

Arrangement of exhaust manifold is somewhat unusual. There are four ports, to which a couple of branched manifolds are bolted, the exhaust pipes having a straight drop just ahead of the crankcase hangers. Delage claims to have overcome usual carbureter difficulties inherent to six-cylinder motors by the use of a double carbureter, as developed on racing models. The car is certainly remarkable for its rapid acceleration. The duplex carbureter is a Claudel production,



Left—Delage six motor. Note Claudel duplex carbureter. Right—Exhaust side, showing unusual manifold construction

uniting two carbureters with a common float chamber. The two tubes and jets are side by side, although independent, and have a common throttle. A Y-shaped intake manifold connects up the two portions of the carbureter with the two ports on right-hand side of motor, the gas passages being surrounded by the circulating water. This model marks Delage's conversion from thermo-syphon to pump so far as stock cars are concerned. Thermo-syphon, however, had never been used on Delage racers. Lubrication is pressure throughout, including direct feed up the connecting-rod to the wristpin.

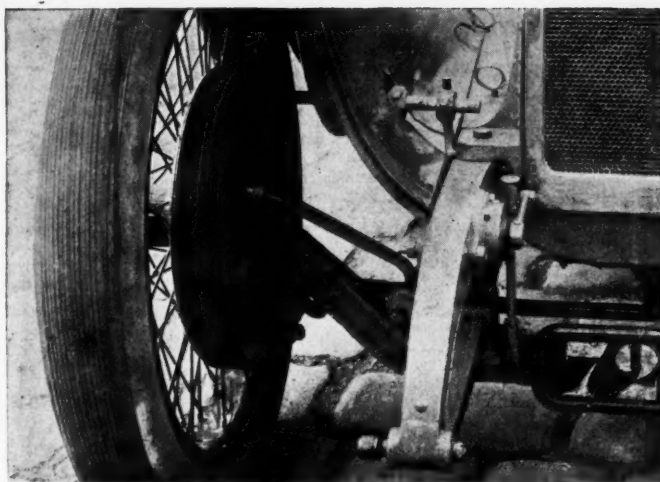
Motor and Gearbox Separate

In designing this new model Delage has decided against unit construction of motor and gearbox. He admits its apparent simplicity, but objects to its lack of balance, the weight being thrown too far forward except when a closed body or full load of passengers are carried. Motor and gearbox are thus separate, and carried on a subframe.

Leather-faced cone clutch has been abandoned in favor of plate clutch lined with Ferrodo. Gearbox is of same design as on racing cars, shafts being short and hollow and ball bearings used throughout. In final drive the only difference between this model and the racing cars is that the differential housing is cast steel instead of aluminum. The bevel driving pinion is supported in ball bearings front and rear, and the drive shafts are hollow. Drive is taken through the rear springs, which have a width of 2.5 in. and a length of 52 in. In the racing models rear springs are semi-elliptic; on the touring cars they are five-eighths elliptic; in each case they are underslung.

Front Wheel Brakes

Another innovation for which racing is responsible is the use of front wheel brakes. They are of exactly the same design as those on last year's Grand Prix racing models, when the hilly and winding nature of the course made braking an important factor. Brake drums are ribbed to assist cooling



Front wheel brakes on the new Delage, a racing adaptation

and are machined all over; shoes are aluminum, lined with Ferrodo. The pedal operates the road wheel brakes and the lever acts on the brake to rear of gearbox. Delage engineers are so satisfied with front wheel brakes, even in the hands of ordinary users, that it is possible the differential brake will be abolished. At present its only use is to hold the car when left on a gradient.

Aluminum Dashboard

An aluminum dashboard is fitted, with the gasoline tank bolted within it. This design makes the tank independent of any portion of the bodywork and facilitates the work of the coach builder. This model will be produced in three chassis lengths; ordinary for full touring car; extra long for closed bodies, and short for sporting type, this latter being sold with a guarantee of 65 m.p.h., but declared to be capable of much more.

Adjustable Stop on O'Kill Indicator

THE accompanying illustrations show an improvement on the O'Kill indicator embodying all the principles of the piston and spring pressure indicating device in that it is provided with an adjustable stop which eliminates all motion of parts and consequent inertia errors when the instrument is adjusted at the instant of taking a pressure reading.

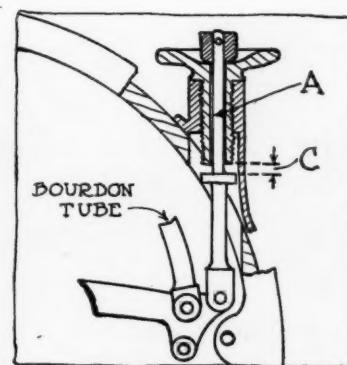
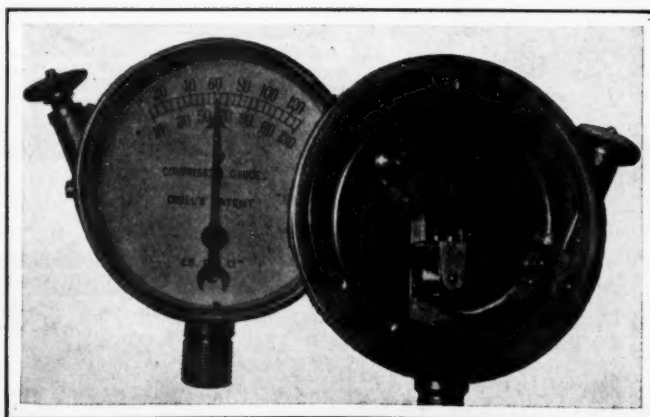
From the working diagram it will be noted that the end of the Bourdon tube is constrained to move in a definite path and the index finger can be made to travel over the entire face of the compression dial by rotating the milled nut shown at the side of the gage. Referring to the sectional drawing, the milled nut together with the rod A which slides through it, constitutes a double stop for the end of the Bourdon tube.

The small amount of clearance at C allows the tube end to move and to vibrate the index finger through a small arc when the gas pressure in the tube and motor cylinder is greater than the tension given to the tube by the milled nut. Thus when the gage is correctly adjusted on a running engine, the finger is at rest, all inertia effect being

eliminated and no shaking of the needle is noticeable.

This dial gage, while not as yet placed on the market, neither in America nor abroad, is patented in this country under number 1,042,958; Oct. 29, 1912.

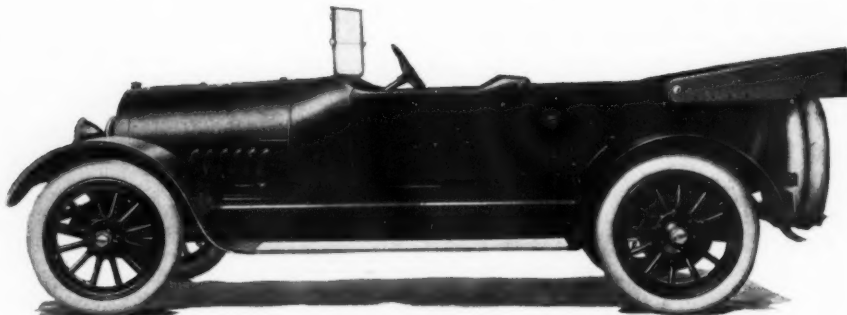
The O'Kill indicator, which was first described by Prof. W. C. Marshall in THE AUTOMOBILE for May 29, 1913, has been greatly improved and simplified in form since that time when it measured 7 in. in height with a maximum diameter of 2½ in., being entirely different in appearance from the up-to-date instrument illustrated herewith. The latest improvement described above, the adjustable stop, should prove a feature of added convenience.



Above—Adjustable stop detail
Left—Improved O'Kill Indicator

McFarlan Cars Larger for 1916

Single Chassis with Either
 4½ by 6 or
 4 by 6 Motor Is
 Continued—Price \$90
 Higher—
 New Spring Suspension
 —Aluminum-Alloy
 Pistons



Seven-passenger McFarlan for 1916 which sells, completely equipped, for \$2,990 with a 4½ by 6 six-cylinder motor and at \$2,680 when fitted with a 4 by 6 six-cylinder motor

BY the clever application of engineering skill the riding qualities, appearance, balance and speed of the McFarlan for 1916 have been greatly improved by the McFarlan Motor Car Co., Connorsville, Ind. While the policy of the concern of marketing one chassis with either a large or smaller six-cylinder motor installed is continued, there have been some material changes of unusual interest and of such a nature as to cause the unfamiliar motorist to pronounce the 1916 model entirely new. Because of the very nature of the alterations, a price increase has been made necessary, and now the large McFarlan, which is equipped with a 4½ by 6 motor, is listed at \$2,990 instead of \$2,900, and the smaller model, the same in every respect with the exception of the motor size, which is 4 by 6, is listed at \$2,680, an increase of \$90 over the former model.

Flat Cantilever Suspension

While the motor is more powerful because of changes in the interior, and while there have been changes made in the drive and body, that of utmost importance is the new form of rear spring suspension which almost approaches in design that used by the English Rolls-Royce. In the McFarlan, cantilever springs are used, but instead of these being arched they are perfectly flat and further are shackled at both ends. They take no drive and torque stresses and hence the double shackling is possible. In the Rolls-Royce the flat spring is used, but the rear portion is under the axle and operates between rollers, while in the McFarlan the spring is fastened on top of the axle housing and uses a shackle for play instead of the rollers.

This form of suspension allows the springs to be flat under normal load, and an exceptionally easy riding car is obtained because of the comparatively slow return after the wheels have encountered an obstruction. Furtherance of the easy riding is also obtained by making the springs long and wide, the dimensions being 58 in. and 3 in. There are fourteen leaves.

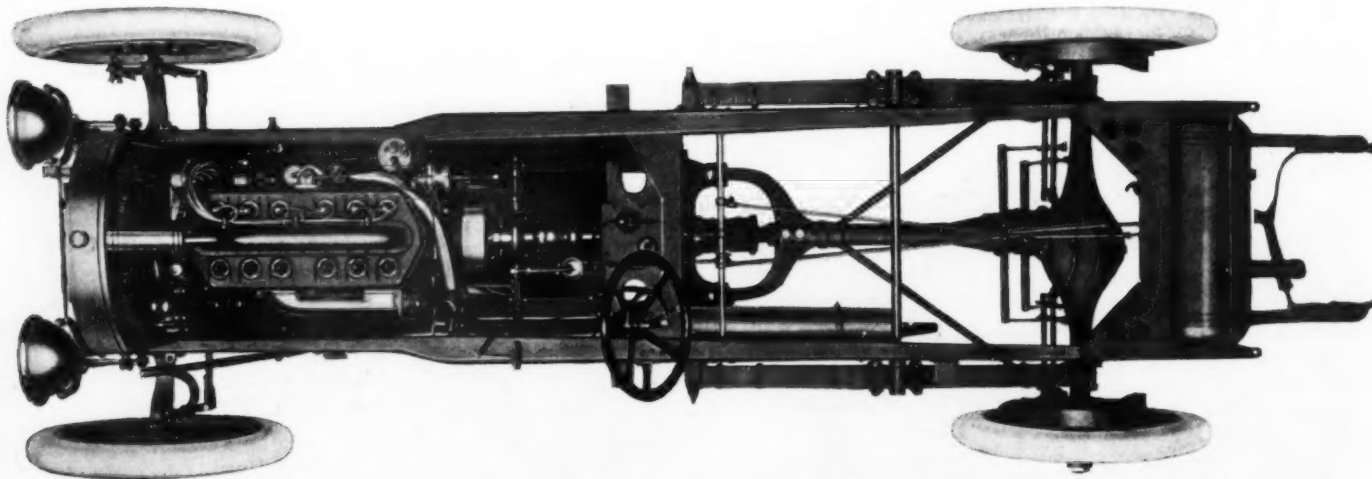
Frame Is Stronger

As in all cases where a cantilever supplants a three-quarter elliptic, frame strengthening is necessary, and in the McFarlan a reinforcement has been placed along the line extending from the front shackle to the oscillating point. The pin here upon which the spring is fulcrumed is of 1¼ in. diameter and extends across the frame.

With the new spring suspension there has been a better all-round balance obtained by removing the gearest from the rear axle and placing it amidships upon a sub-frame and at the same time bringing the motor down to rest upon this sub-frame instead of in the regular frame channels. A general stiffening of the whole assembly has been brought about by this re-arrangement of units and in conjunction with the new cantilevers give a car which is extremely free from air riding, that is the wheels stick to the ground even in rough going. Riding qualities have been improved two-fold over the previous model with the three-quarter suspension.

Aluminum Alloy Pistons

The motor still is a T-head design with block cast cylinders, but its speed capabilities have been increased to some degree



Plan view of McFarlan six chassis for 1916, showing new flat cantilever spring suspension. Note cross rod to insure strength

because of the fitting of aluminum-alloy pistons instead of cast iron and lighter rods, although the latter have the same section. Just what maximum speed now is obtainable is yet an uncertainty, but one will not be far from correct by saying a good one-third greater speed is possible.

Now that the r.p.m. is greater than before, it has been thought advisable to install a plunger pump, driven from the exhaust camshaft, this pump forcing oil directly to the four main bearings. The pistons and cylinders are lubricated by constant-level splash as before. The carburetor still is a Stromberg and the feed as before by a short manifold to the valves. These are 2 in. in the clear and have cast-iron heads.

Cranking Motor on Right

While the cranking, lighting and ignition system remains of Westinghouse make, there have been changes in location, the cranking motor now being on the right side instead of the left and turning the engine over by means of a toothed flywheel instead of through a train of gears connecting with the crankshaft at the forward end. It also is lower than in the 1915 model.

The combination generator and ignition apparatus is on the left as before, but it is lower so as to offer less restriction in making valve tappet adjustments and stands slightly farther away from the motor. The latter change has been necessary because the water pump formerly an integral part of the crankcase now is a separate unit driven directly from the timing gears. Pump capacity is 10 per cent greater than in 1915.

The separation of the pump as a portion of the case has been done to make replacement easy, in the remote event this is necessary. The water pump shaft continues to drive a two-cylinder O. B. air pump.

Aluminum Cone Clutch

In the cone clutch there has been but one alteration, a change from a pressed-steel cone to one of cast-aluminum. This clutch is a leather-faced type of 14 in. diameter and 4 in. face with twelve flat springs under the leather. Now that there has been a weight reduction in the cone there is a lower turning momentum and hence less chance for spinning with its consequent harsh gear changing.

Propeller Shaft Inclosed

The gearset, which as previously stated, is amidships on a sub-frame, is a Brown-Lipe using ball bearings instead of rollers and a squared shaft of 1½ in. diameter, making it heavier than before. It uses a four-point mounting and drives an inclosed propeller shaft, the tube having a wide-yoked end as before. This tube, braced by rods running to the axle housing, takes both drive and torque.

Axle Knuckles Castered

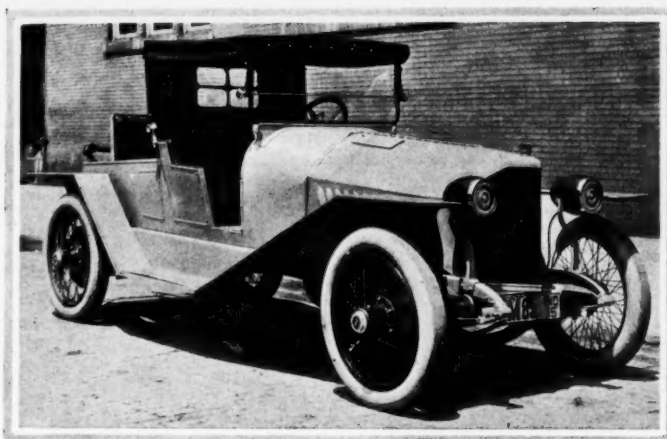
There is only one other mechanical change of importance and that is the front axle knuckles are castered slightly as against being straight as used in 1915. This has helped to make the front wheels hold to the ground.

The wheelbase still is 132 in., but the tires fitted now are Silvertown cords 36 by 4½ in.

A visit to the McFarlan factory is convincing evidence that the concern makes a detail study of body design. A large portion of the factory is devoted to the building of all types, including special creations which many buyers conceive, together with those which the company uses as stock equipment.

Better Body Lines

The standard body for 1916 is a seven-passenger design, showing detail improvement over the previous design, this being especially true of the front portion. While the body still is a double-cowl design, it is hung lower than before and has a better rounding out of the cowl and hood. This has



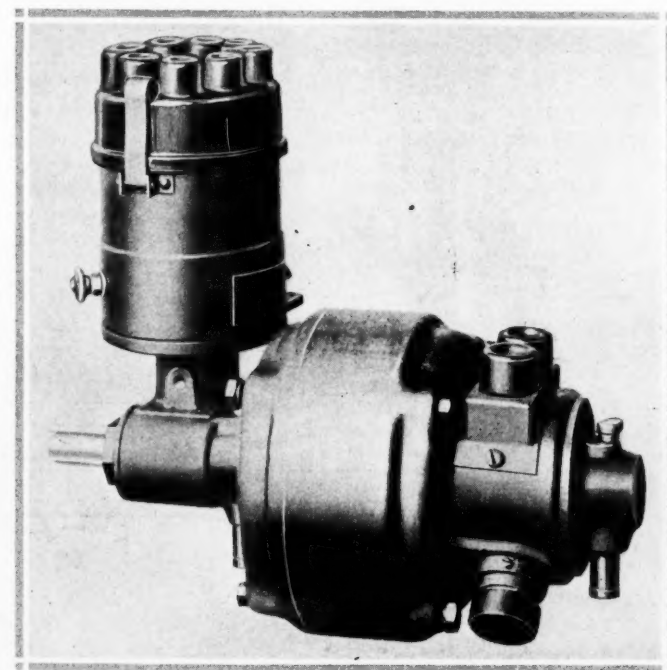
McFarlan Cubist roadster, a new body type for 1916

been helped by widening the cowl, and by raising it the leg room in front has been increased. The rounded front has called for a new design of radiator and windshield, both of which harmonize better with the rest of the design. The upholstery has a wider piping, but is of the same material as before.

Westinghouse Ignition for Eights

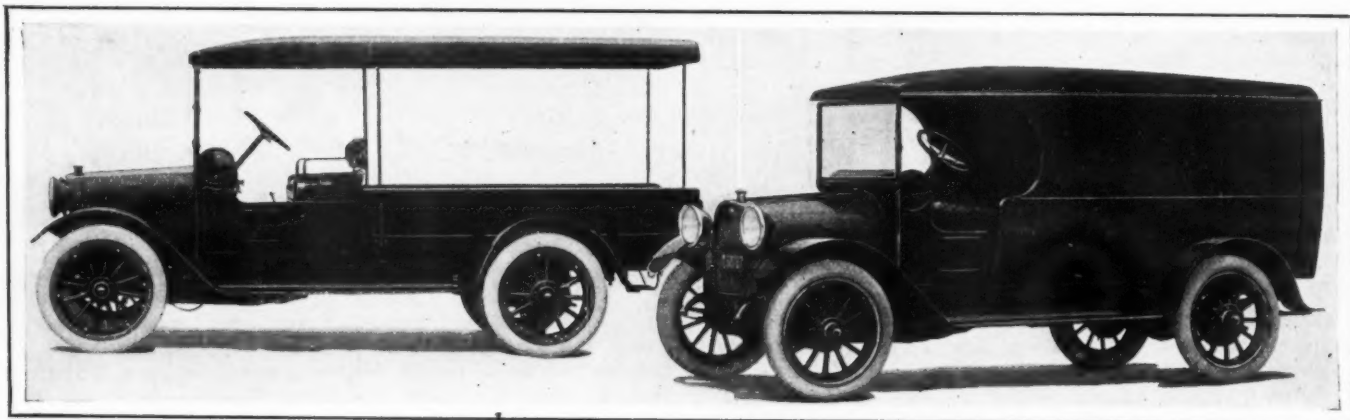
To accommodate the needs of eight-cylinder motors, the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has brought out a distributor to suit its vertical type of ignition and which will provide current for an eight-cylinder motor. The outfit comprises a vertical ignition unit, an ignition switch, a ballast resistor and the battery. These equipments are made to operate on a 6 or 12-volt circuit and are suitable for four, six or eight cylinders.

The Westinghouse vertical ignition unit is made up of four essential parts, namely: the interrupter, the condenser, the induction coil and the distributor, contained in one housing. The ignition switch is a simple single pole; the ballast resistor, which is part of the equipment, is in series with the primary circuit. Its use prevents burning of the contact points. Any standard make of battery may be used.



Westinghouse vertical ignition unit mounted on lighting generator for eight-cylinder cars

Electric System on Reo $\frac{3}{4}$ -Ton Truck



The new Reo $\frac{3}{4}$ -ton delivery wagon with open express body

The same chassis equipped with full panel delivery body

THE Reo Motor Truck Co., Lansing, Mich., has brought out a $\frac{3}{4}$ -ton delivery car having a normal capacity of 1500 lb. and a maximum capacity including the weight of the body of 1800 lb. It is designed to run at a speed of 22 m.p.h. and is mounted on a 120-in. wheelbase with standard 56-in. tread.

The price of the complete truck with the standard express body and canopy top is \$1,075 f.o.b. Lansing and for the chassis only, including the equipment but minus the express body, driver's seat, canopy top, windshield, is \$1,000 f.o.b. Lansing.

Motor $4\frac{1}{2}$ by $4\frac{1}{2}$

The motor has a nominal rating of 35 hp. It is a pair-cast $4\frac{1}{2}$ by $4\frac{1}{2}$ four having the heads integral. The valves are the conventional 45-deg. poppet, having a clear diameter of $1\frac{1}{4}$ in. The inlet valves are mounted in the head and the exhaust on the side. The pistons are of gray cast iron provided with two three-piece rings delivering the drive to I-section drop-forged connecting-rods $9\frac{1}{2}$ in. long with $1\frac{1}{4}$ by $2\frac{1}{4}$ -in. bearings lined with babbitt. The crankshaft is a drop forging from manganese steel, heat treated and ground to size. The main bearings are lined with nickel babbitt, each

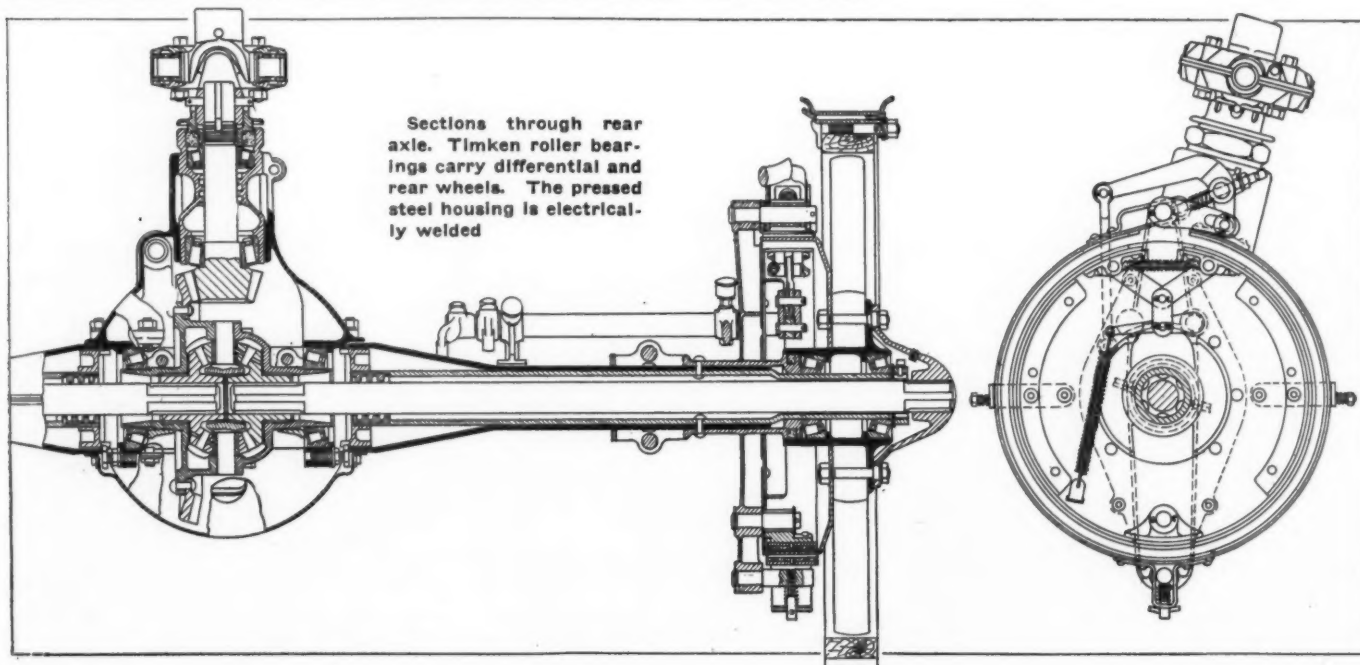
$1\frac{1}{2}$ in. in diameter with a $2\frac{3}{4}$ length in front and center and 4 in. long in rear. These bearings are adjustable from the exterior of the crankcase. The camshaft carries the cams forged integrally running in die-cast bearings. The timing gears are helical.

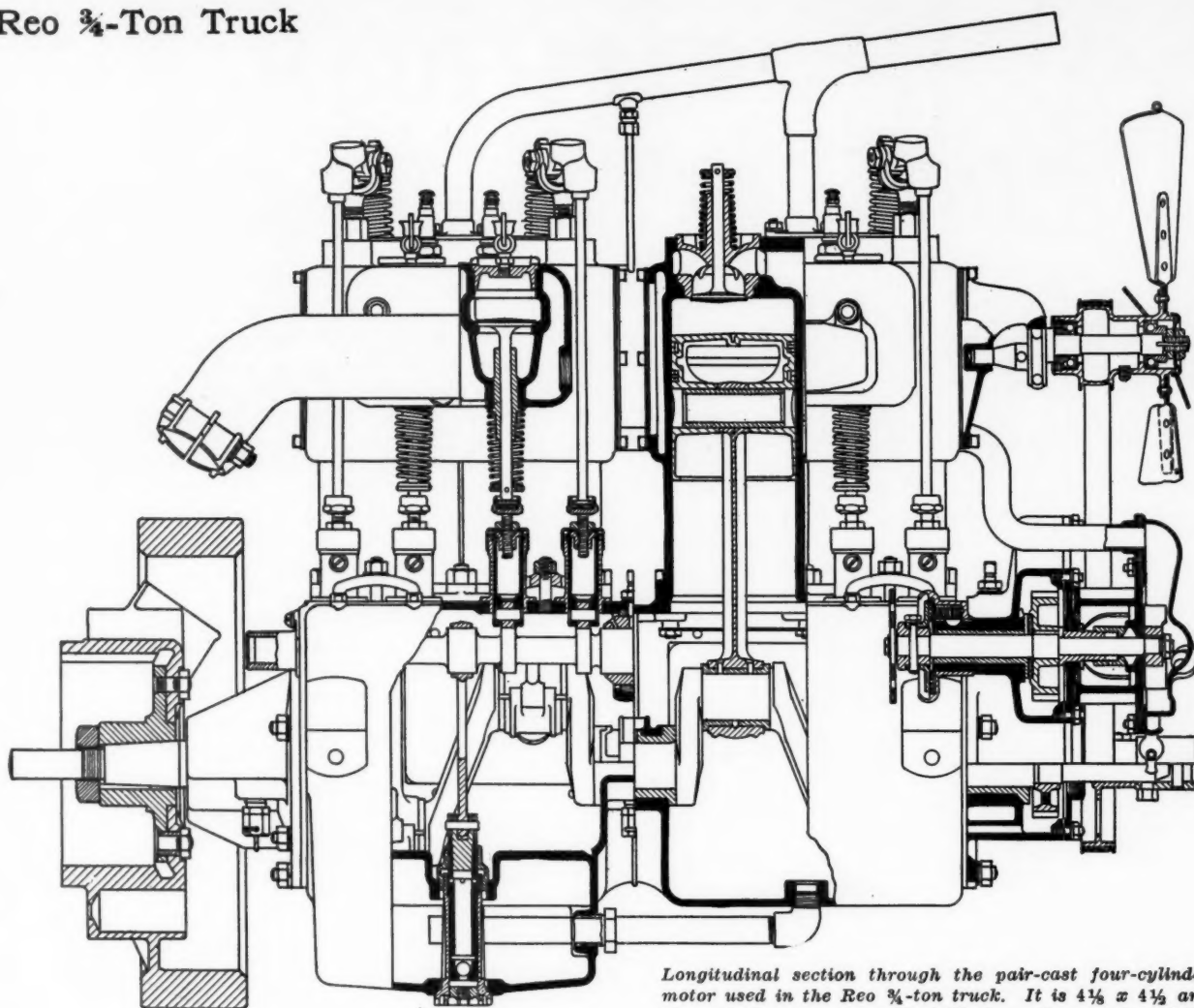
Oiling is combination force-feed and splash. The reservoir is in the crankcase bottom and feed is by a plunger pump under pressure to the main bearings and timing gears. The cylinders are lubricated by splash.

Carburetion is by a Johnson float-feed automatic water-jacketed carburetor fitted with an air intake connected with a stove on the exhaust and provided with dash air control.

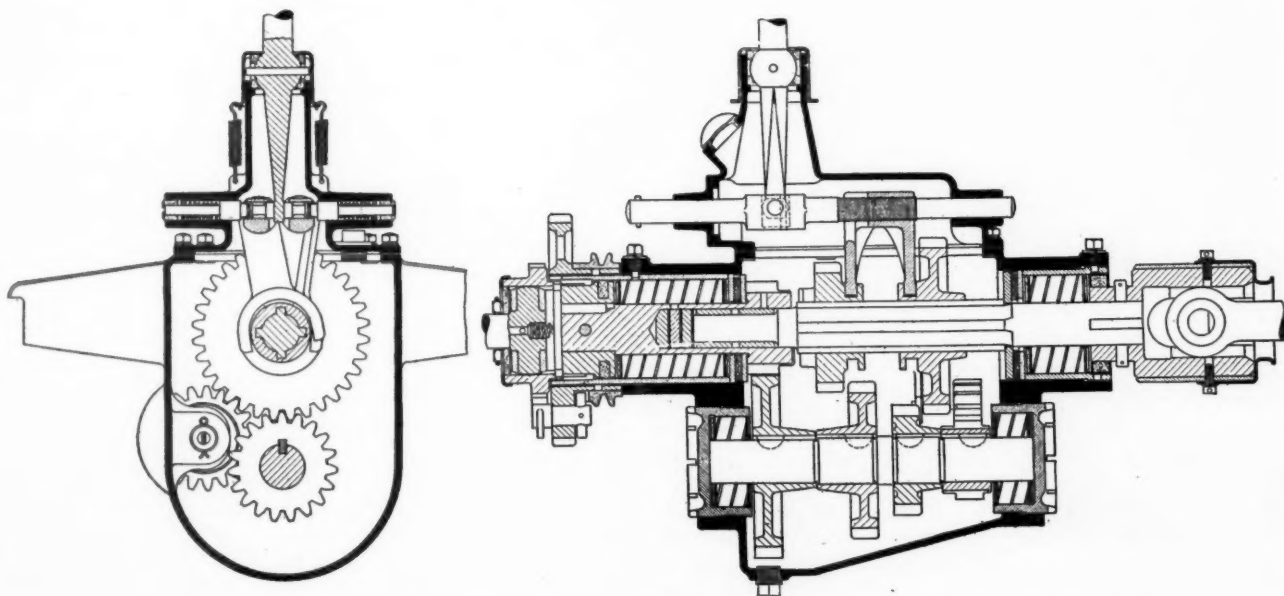
Ignition is provided by a Remy generator, which also furnishes current to the storage battery for lighting and starting. The entire electric system is operated at 6 volts and is a two-unit device with the starting motor mounted over the front end of the gearset. The car has head lamps with dimmers and also an instrument and tail lamp.

From the motor the drive is taken through a thirteen-plate dry-disk clutch through a three-speed sliding selective gearset provided with case-hardened gears having $\frac{7}{8}$ -in. face width. The axle ratio is 4 to 1 on high speed, 7.2 to 1 on second and 14.8 to 1 on low.



Reo $\frac{3}{4}$ -Ton Truck

Longitudinal section through the pair-cast four-cylinder motor used in the Reo $\frac{3}{4}$ -ton truck. It is $4\frac{1}{2} \times 4\frac{1}{2}$ and the main bearings are adjustable from the exterior of the crankcase



The three-speed selective gearset is carried throughout on roller bearings and is arranged to provide center control, being mounted amidship on a subframe. The gears are case-hardened and have a $\frac{3}{8}$ -in. face width

The Rostrum



Suggests Wider Turns at Corners

EDITOR THE AUTOMOBILE:—At most street intersections the radius of the curb at the street corner is such that a motorist desiring to turn the corner finds it impossible to describe an arc of turn that will enable him to maintain a moderate rate of speed and still keep his machine on the proper side of the pavement while turning into the cross street. The radius of the curb curve is usually but little over a foot, hence the driver cannot commence to turn until he has practically passed the corner. Increasing the radius of the corner curve up to, say, 12 or 14 ft., will permit most types of cars to turn a corner at the same distance from the curb as when driving down the street.

Changes such as suggested by the accompanying sketch, Fig. 1, have been made at several street intersections in Chicago, notably at Lincoln Parkway and Diversey Boulevard, and at Devon and Evanston Avenues.

How materially the possibilities of making the desired turn within the proper confines are facilitated will be seen by referring to the sketch. The double dotted lines show the curb at the usual street corner, while the double solid lines back of these illustrate what has been accomplished at the two localities mentioned—the change at Lincoln Parkway and Diversey Boulevard being shown in an accompanying photograph.

Without such construction a driver following the line A in the direction noted by the arrow, and turning into the intersecting street, would have to cross its center line and could not pass two cars coming toward him as indicated by the arrows B. Increasing the radius of the curve, as shown by the solid lines, permits the driver to follow the arc of the curb and thus keep to the right of the center line of the street where he properly belongs. This is clearly illustrated by the line C.

Such an improvement is particularly desirable on boulevards or where other streets intersect with boulevards. It is likewise desirable at intersections of narrow streets. This subject deserves the attention of engineers in charge of street improvements, and the practice suggested should be universally adopted, if for no other reason than to increase safety.

Chicago, Ill. W. M. V.

Battery Voltage Determines Circuit Voltage

EDITOR THE AUTOMOBILE:—I have a 1914 Case 25 which has a Westinghouse electric system and storage battery. My battery is out of order and I want to have it adjusted. Will I have to disconnect my generator or can I connect the generator to the lights without harming the generator or lights?

2—If I can use the generator without the battery, please give a diagram of how this can be done.

Geren, Miss.

P. P. M.

—The winding of this generator is such that the series and shunt fields oppose one another with the values so proportioned that with the battery connected in circuit the charging rate is determined by the specific gravity of the electrolyte

in the battery and the car speed in m.p.h. The battery voltage determines the voltage of the entire electrical circuit. If the battery were to be removed this voltage would attain a very high value approximating 28 to 30 volts since the differential effect of the field winders cannot be obtained unless current is flowing through the series field to the battery.

It is suggested that you use another battery while the present one is being repaired in case you desire to drive at night, and if you desire to drive only in the daytime successful operation may be secured by withdrawing one brush from the brush holder. If you do this you should take great care to replace the brush in exactly the same manner as it is removed after your battery has been reinstalled.

2—This question is answered in the preceding paragraph.

Information on Owen Magnetic Car

EDITOR THE AUTOMOBILE:—In a recent issue of THE AUTOMOBILE I read an explanation and description of the Owen Magnetic car. I would like to know where this car is built and by whom, as we are very much interested.

Quincy, Ill.

EDGAR J. R.

The Owen Magnetic chassis was described in THE AUTOMOBILE for July 15, page 102. It is manufactured by the Owen Magnetic Car Co., 1760 Broadway, New York City.

Twelves Are Small But Powerful

EDITOR THE AUTOMOBILE:—Who builds the new Fiat radiator?

2—Who built the 1913 Regal including the frame?

3—Who manufactures the Weidely motor?

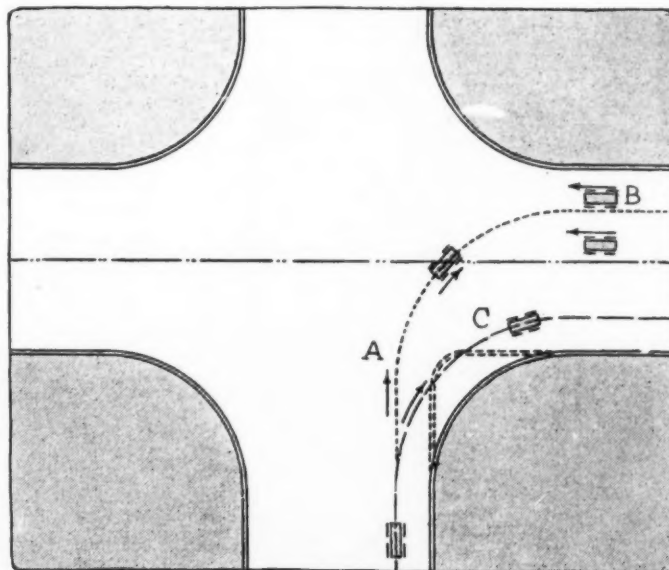


Fig. 1—Sketch showing suggested changes in laying out curves at street corners



Proper curb radius to allow of turn at medium speed



Improper radius which causes vehicles to swing to the wrong side

4—What company manufactures hoods for the Fiat and Singer respectively?

5—Has any motor builder yet brought out a small, light twin-six motor?

6—How many small eight-cylinder engines are there, and who builds them?

Bridgeport, Conn.

W. J. B.

—The makers of the Fiat radiator are known only to the Fiat Co. and to these makers as the information is held confidential by them.

2—The 1913 Regal car was built practically entirely by specializing concerns and assembled by the Regal Motor Car Co. in Detroit. The frames were manufactured by the A. O. Smith Co., Milwaukee, Wis., from Regal dies.

3—The Weidely motor is manufactured by the Weidely Motor Co., Indianapolis, Ind.

4—The Fiat hood is manufactured by the Fiat Co., Poughkeepsie, N. Y., and the Singer by the Singer Motor Car Co., Long Island City, N. Y.

5—The twin-six motors announced this season have all been of the small and light variety. It must be remembered that even with a small horsepower per cylinder a twelve-cylinder motor would be very powerful. For instance, if each cylinder were capable of developing only 4 hp. a twelve-cylinder motor of this size would have 48 horsepower. By small eight-cylinder motors it is difficult to know what you mean as all of the eights so far as small bore, long stroke, high speed designs with small piston displacement considering the number of cylinders. Some of the later cars such as the Briscoe are using eight-cylinder units, however, which are quite small and these are manufactured by motor specialists. Eight-cylinder motors in small size can now be purchased from any of the larger motor manufacturers.

Referee Can Disqualify for Smoke

Editor THE AUTOMOBILE:—The Galax, Va., Fair Assn., is planning an automobile race during the County fair, Sept. 1, 2 and 3.

If there is a set of rules for sale will you please give me the name and address of the company who can furnish this to me? Would thank you if you would tell me whether a car could be ruled off the track on account of the engine emitting too much smoke, and if a driver should be put off the track for cutting across in front of the car that was about to pass.

Mt. Airy, N. C.

C. O. S.

You can secure a set of rules from the American Automobile Association, 437 Fifth Ave., New York. This association

has charge of all the sanctioned races held in this country and its rules are followed in all the official races. According to the rules of the A. A. A. a car can be ruled off the track by the referee if in any way it endangers the safety of other contestants or spectators. Should a car be smoking to such an extent as to fall under this head it could certainly be ruled off the track. A driver who cuts in front of another trying to pass him is certainly acting in a way which should merit disqualification and it would be the duty of the referee to disqualify him.

Improper Gear Adjustment Causes Hum

Editor THE AUTOMOBILE:—Kindly advise me how I can eliminate a noise occurring in the differential on a Mitchell 1914 car model A.

Would like to know how to adjust this so that I will not have to buy a new gear.

Westville, Conn.

A. R.

—The only adjustment of the rear axle gears necessary is to obtain the proper mesh of the two driving gears. If these gears get out of proper adjustment there will be an excessive humming noise in the rear axle.

To adjust the gears remove the plate at the top rear of driveshaft housing. Turn the adjusting collar by placing a tool in one of the small holes through the collar, turning the collar to the right meshes the gears tighter. It is a very good plan to make this adjustment while driving the car on a smooth road. Adjustments can easily be reached by removing the floorboard in the tonneau.

Sandpaper Leaves Commutator Mica High

Editor THE AUTOMOBILE:—I have had trouble with my Rushmore generator. The ammeter shows only a slight current. After I clean off the commutator with sandpaper it seems to work all right for a short time, but very soon the old trouble sets in. Have had the car in a shop undergoing the same treatment for this trouble, but with no success.

San Francisco, Cal.

C. P. GRIFFIN.

—The difficulty which you are having is no doubt due to a rough commutator. Cleaning with sandpaper while it cleans the bars of the commutator, will leave the mica high, with the result that the brushes make imperfect contact and the commutator bars soon burn black. The only way to correct this trouble is to remove the armature and have the commutator turned down in a lathe. There is also a possibility that the brushes which you are using are too soft.

Economic Causes of the War Traced to Mushroom Growth of German Industries

Picture of Teuton States as One Vast Money-Making Trust Whose Suction Tentacles Circle the Earth

A Lecture by Henri Hauser, Professor at the University of Dijon and Correspondent of the Institut de France, reported by A. Dumas, Editor of *Le Génie Civil*

CONTRARY to the common opinion that the war is solely due to the military party, Professor Hauser shows clearly that it was through an excessive and especially a too rapid development of the industries and commerce of Germany that the war became if not a necessity for her government at least such a favorable prospect that the temptation of resorting to it could not be resisted. In the unanimous enthusiasm, he says, with which this people greeted the bloody dawn of armed conflict the voices of the commercial and industrial classes were not the least clamorous. Financiers, factory managers and even workingmen figured in the front ranks among the defenders of imperialism.

The economic causes played a predominating part in the explosion of July, 1914. It is perhaps not true, as has been so frequently contended, that Germany was menaced with overpopulation and stood in urgent need of colonies. But it is not, in fact, necessary to know if Germany was really choking. She thought she was choking and acted in a haunting fear of constrictive forces whose hold she wanted to break at any cost. Mr. Hauser undertakes to explain this "pathological phenomenon of collective psychology."

I—Evolution of the German Industries

What strikes one first of all in the evolution of the German industries is the real grandeur of the phenomenon. There is something impressive in the spectacle of this people which forty years ago scarcely counted in the geography of world economics and which just before this war had managed to become one of the great forces. With a foreign commerce amounting to nearly 5,000 million dollars in volume it ranked second among commercial people, following England. It had become second in the production of castings and of iron, beating England, second also in the production of steel. Its merchant marine, which was inferior to ours [the French] in 1870, was outclassed in 1913 only by those of England and the United States.

Genius for Organization

We have admired all of that. Should we, because Germany has now dishonored herself by crimes, deny our previous admirations? No, for us Frenchmen the truth remains always the truth. It is therefore not difficult for us to recognize that the German people have given proof of remarkable qualities since the foundation of the Empire. The leading quality was a determined enthusiasm for work, not a feverish spell which raises mountains in a few days but the tenacious patient labor of every day, regular and systematic. Ostwald is right when he attributes to the Germans the sense and the spirit for organization. They have brought to perfection the art of utilizing men, of putting each in his place, of getting the maximum performance from every individual. If the genius for great discoveries seems to have deserted their soil of late years, they are past masters in the industrial application of scientific discoveries. As has been

often said, it is the union of the laboratory and the workshop which has created the German wealth.

Next to the union of shop and laboratory there should be mentioned the utilization by commercial managers of the research work of economists, geographers and historians. For the methods which they applied to the production of a new aniline color they also brought to bear on the search for markets and on the organization of trade channels. The German chemist and the German commercial traveler marched at the same gait to accomplish the conquest of the earth.

Leap from Poverty to Wealth

The rapidity of the German evolution has been almost catastrophic. From the complex of agricultural states sprinkled with industrial spots which comprised the *Zollverein* (customs union) in 1870 the industrial Empire has risen in a few years by a sort of historical face-about without any of that slow secular preparation which characterizes for example the English growth of power. Industrial Germany is a consummation in which Time has no share. Among the captains of industry, as nearly everywhere in modern Germany, the upstart abounds.

The following facts illustrate this industrial development: In 1893 the consumption of pig iron per capita did not quite reach 99 kilograms per year; in 1899 it was 155. The coal consumption passed from 1940 to 2740 kilograms. During the same time the production of iron and castings climbed from less than 5 million tons to more than 8; that of charcoal from 95 millions to 136. The increase of production was so intense during this period that it seemed unsound, and the great commercial crisis of 1901 had to be weathered. But the poor country had become, of a sudden, a very rich country. In 1895 the income from the fortunes of the Empire was estimated at somewhat above 4,000 million dollars; in 1913 the corresponding valuations fluctuated from 8,000 to 10,000 millions, and German wealth was estimated at 64,000 millions, of which nearly 2,000 millions was deposited in commercial banks and 3,600 millions in savings banks. These were the figures to which Dr. Helfferich, director of the *Deutsche Bank* and now Prussian minister of finance, pointed with pride on the occasion of the twenty-fifth anniversary in the reign of William II.

(Other figures from the *Journal de Genève* of Aug. 1, 1915, give an idea of the enormous increase in the commercial operations of Germany which has taken place during the past few years. The imports and exports of merchandise and precious metals were as follows, in round millions of dollars:

	Imports.	Exports.
1909	1771	1371
1911	2001	1645
1913	2241	2040

Adding the figures for imports and exports one obtains a trade volume for 1909 of 3,142 million dollars and for 1913

the sum of 4,281 million dollars, being an increase during these four years of 1,139 millions or more than 40 per cent.

Other figures are given by Edmond Thery and show that in ten years from 1903 to 1913 the volume of the foreign commerce of Germany passed from 2,863 to 5,217 million dollars, an increase of 82 per cent).

This sudden growth of German wealth has had the gravest influence upon the living conditions of the German people. The two most notable effects have been the gradual disappearance of the rural class and the sudden stopping of emigration.

Scarcity of Farm Labor

No conception could be more false than that of Germany as an overpopulated country. While the population has grown since 1871 from 40 to 70 millions and 800,000 new Germans see the light of day every year (despite a decreasing birth rate), this increase cannot be considered excessive, as 700,000 Slav laborers are engaged every year to work the large Eastern estates and large numbers of Italian, Croatian and Polish workmen are in demand for the mines and various enterprises in the cities.

The German emigration exceeded 200,000 annually from 1880 to 1883 but has now dwindled to 20,000, or about the same as the French.

There is, to be sure, a German migration, but it is interior, from the country to the towns, from the plough to the industries. Since 1895 the rural population has been less than half of the total; it is now 44 per cent. Out of 67 million Germans barely 17 millions are farmers or derive their living from agriculture. An enormous number of peasants quit the soil every year and find work in the colossal factories. This has brought the number of towns with more than 100,000 inhabitants to at least 45 and accounts for the armies of workmen at disposal for the large concerns. The Mannesmann shops employ 15,000, Thyssen more than 30,000 and the Krupp works 73,000, almost two army corps. Germany has passed definitely from the type of the agrarian state to that of the industrial state.

II—The Needs of the Industrial State

Now, the industrial state has needs and exigencies which the agricultural state has not. The latter lives on itself and for itself, and it can live on itself. The industrial state is by nature "tentacular," to use Lamprecht's term, being specially founded upon the importation of commodities and raw materials and on the export of the manufactured products. It requires first of all the importation of foodstuffs. It is calculated that about 20 million Germans out of 67 millions depend for their nourishment upon foreign harvests and foreign cattle. The industrial state has need of certain materials which are either not produced at all within her boundaries, as in this case for example cotton, or which exist there only in insufficient quantity, as for example iron. By reason of the enormous development of its iron and steel industries the German Empire, while remaining rich in fuels, depends for its ore in ever increasing degree upon Sweden, Spain, North Africa and France. It is this fact which explains her ardent lustfulness for the Briey valley.

Cotton in bales represents the largest single import article of the Germans, amounting in value to more than \$125,000,000. The cotton industry employs more than 1,500,000 workers and turns out goods valued at over \$250,000,000.

Credits in Place of Capital

The industrial state needs capital and though Germany has become prodigiously rich the German industries remain terrible gluttons for capital. They absorb it as fast as it can be provided, to use it in building new works and replacing old machine tools. In the formidable battle in which Germany has engaged herself she is condemned to gain victories every day, for any defeat and in fact any let-up would be

mortal. She swallows new capital before it is born, so to say, since she anticipates it through credit. Corporations with imposing capitals which lean on the industrial banks, the latter drawing upon the central banks and especially on the *Deutsche Bank*, and these large banks in turn absorbing all the country's available wealth and to some extent foreign capital as well—all this is a marvelous financial edifice but frail. The very denials of German financiers prove that the influx of foreign money is not negligible.

Socialists Turned Imperialists

Further, Germany needs customers even more than capital. Despite its increase in numbers, its rapidly growing wealth and taste for high living the German people is incapable of digesting all of the enormous production of German factories. It must more and more be sold abroad.

Everything conspires thus to turn Germany into a Tentacle State, to make it push its trade into all corners of the world. The country's financial staff must have recourse to world politics to replenish its capitals, to pay the wages of its workers; the proletariat depends upon them in order to have steady work and to satisfy its growing wants. Therefore the German socialism has become imperialistic.

III—Industry and World Politics

Among the means for developing exports the leading one is the system of bounties. Since the German industry must work more for the foreign than for the home trade, it is logical to sell at low prices abroad, sometimes even to sell at a loss, in order to gain new outlets and discourage all competitors. Thanks to the grouping in *Kartells* (trusts) of the principal economical forces, nothing is easier. In 1902 the coke syndicate forced the German consumer to pay 15 marks per ton at the same time as it conceded the price of 11 marks on large foreign sales. In the latter half of 1900 the wire syndicate made sales abroad at 14 marks per 100 kilograms while the home price was 25. It lost 859,000 marks on the foreign turn-over but made a profit at home of 1,177,000 marks. The difference was net gain. But in this instance, for that matter, the trick was overdone, for speculators managed to buy back the German wire abroad and to resell it in Germany with profit.

The Precarious Treaty System

The bounty system is supplemented by that of commercial treaties which favor the entry abroad of commodities and travelers and which secure a moderation of the customs tariff for German products. Such was the tenor of the German-Russian treaty of 1904, which tended to turn Russia into an economic colony of Germany. In the interior politics it is the avowed object of these treaties "to compensate by means of increased wages for the increased cost of foodstuffs" or, in other words to maintain the balance of interests between the industrial population of the West and the agrarian population of the East.

Hungry for Iron

To fend off an iron famine it was necessary to secure control of new ore deposits, and for this purpose numerous German corporations, more or less disguised, acquired mining properties in the Briey basin [the principal iron mining region of northern France, now occupied by the German army]. Thyssen, the great German iron king, not only installed himself there but sent his prospectors as far as Diélette, near Cherbourg, to search for ore—even under the sea—and he contributed to the erection of the ore smelters at Caen. He finds the double advantage in these operations of securing our ore and of selling us coke—an advantage in which, however, the French operators are also beneficiaries.

With iron from Lorraine and Normandy and the coal of Westphalia under control, Germany can dominate the world, says Mr. Hauser. And to assure such domination it is of importance to remove all competition, to install the German

industry in the very heart of rival countries. The extraordinary manipulations by which the German operators worked themselves into French chemical and electrical works were described before the war began. At Neuville-sur-Saône it was the *Badische Anilin und Soda Fabrik* of Ludwigshafen which under a French name furnished alizarine for dyeing French military trousers red, and perhaps the same company moreover inspired the press campaign in favor of this dangerous military color which was conducted with a grand display of sentimental argumentation. What else was the *Compagnie parisienne des couleurs d'aniline* but a branch of Meister, Lucius & Brünig of Hoechst? It has been told how a Darmstadt company manufacturing pharmaceutical preparations came to Montereau to establish a branch factory and kill a similar French factory which had been established there, and how the *Allgemeine Electricitäts Gesellschaft* pounced upon Rouen, Nantes, Algiers, Ora and Chateauroux.

Secret Invasions Everywhere

Similar conquests were engineered at Sevilla and Granada in Spain, at Buenos Aires, at Montevideo, at Mendoza, at Santiago and Valparaiso, while the other large German electrical company, the Siemens-Schuckert, installed itself at Creil. Turkey, Russia, Italy, Switzerland fared the same as France. A few weeks ago a Swiss journal enumerated the following enterprises. *Société anonyme pour l'industrie de l'aluminium* at Neuchâtel with 8 German, 1 Austrian and 6 Swiss directors; *Banque des chemins de fer orientaux* at Zurich, with 8 German, 1 French, 1 Belgian, 1 Austrian and 5 Swiss directors; *Banque pour entreprises électriques* at Zurich, with 15 German as against 5 Swiss directors; *Société des valeurs des métaux* at Basel, with 10 Germans against 5 Swiss. It is notable that the capital stock is mainly in German hands while the bonds, whose modest rate of interest does not tempt the Germans, are placed in Switzerland. "Thus," concludes the *Gazette de Lausanne*, "the money of the Swiss bondholder serves to nourish the German enterprises which come into our own country to compete with our national industries."

Italy Under Tribute

In Italy's case a remarkable study of the subject has been published by Giovanni Preziosi in a series of articles now appearing in pamphlet form under the title: *La Germania alla conquista dell'Italia* (Germany at the Conquest of Italy). The question is in fact of a war of conquest, and one conducted with an admirable sense for organization. At the center there is a financial general staff constituted by the *Banca commerciale italiana*; of course *italiana*, as the companies established in France are *françaises* or *parisiennes*. This is only a little bit of Germanic strategy in which we find the very image of the Tentacle State. By installing itself in the directorates and practising, by means of a system of secret emoluments, a plan for commercial espionage which ruins stubborn opponents over night, it has been able to absorb by slow degrees the economical energies of a whole people, their credit establishments, their navigation companies, their industrial enterprises. It has been able to corrupt the political life, to unmake ministers and to control elections. Here, as in Switzerland, the German or pseudo-Italian banks "act as suction pumps in Italy and as force pumps for Germany." Italy, while rated as a poor country, furnishes capital for rich Germany.

IV—The Hand of the State

Mr. Hauser furnishes some data on the manner in which the prestige and force of the Empire are placed at the disposal of financiers in order to uphold the politics of economical conquest.

To make of the German nation, of the state, an instru-

ment for German expansion is the object of the politics which German economists have so fittingly termed *Handels und Machtpolitik* (commerce and power politics). The blending of the two objects [commerce and power] appears nowhere more clearly than in the report delivered in London in February, 1914, by Sir Edmund Goschen on "An Official German Organization to Influence the Press of Other Countries." What a situation it discloses!

Reptilian Press Bureaus

The *Norddeutscher Lloyd*, the *Hamburg-America*, the *Deutsche Bank*, the *Diskonto Gesellschaft*, the A. E. G., the Siemens-Schuckert, Krupp, Gruson, etc., form together a private corporation which is subsidized by the Imperial Office of Foreign Affairs. In alliance with the Wolff Bureau, this corporation has for its object "to promote the industrial prestige of Germany abroad." It furnishes foreign journals gratis or at a nominal price and in their own language all kinds of information relating to Germany and favorable to Germany. It suppresses this service when the recipients do not prove themselves docile. "To react against tendentious news regarding Germany or attacks upon her and to spread knowledge of the true situation of German industries" is the ostensible program. In other words, an organization for industrial espionage, to use the term employed by Preziosi, placed under the control of the Empire.

The Little German Books

Russia is for Germany a reservoir of labor and a market. If Russia in 1917 should refuse to renew the disastrous treaty which was forced upon her during the unfortunate period of the Japanese war, if she should discontinue the existing system of passports for agricultural laborers, what would become of the capitalistic agriculture—more and more industrialized, more and more in the hands of banking institutions—of the large estates in Brandenburg, in Pomerania and in Prussia?

France is for Germany a banker and a furnisher of ore. What a temptation to go and grab with both hands in the wool stocking which now on occasion is tied up so jealously! What a temptation also to go and get rectified the error of moderation committed in 1871! As early as 1911 the *Gazette du Rhin et de Westphalie* gave voice to the opinion that the ore deposits in Lorraine and in Luxemburg ought to be under the same government as those of Westphalia and the Saar valley.

As for England, the direct competitor of Germany in all the markets of the world, and maker of the same products, she is the enemy that must be downed. Has she not adopted the habit, and made France adopt it too, no longer to loan money to poor states except with the accompaniment of good commercial orders? The time is passing when good German business could be done in Turkey with British or French gold. The rivals of Germany are learning to practise *Handels und Machtpolitik* themselves. But what will happen to Essen, Gelsenkirchen and the whole immense industrial city that Westphalia has become, if the Roumanians, the Greeks, the Serbs order their cannon and their armor-clads, their rails or their locomotives at Glasgow or at Creusot?

War seemed preferable to Germany to this economical crush, and the hand of iron took the place of the velvet glove.

Situation of Russia, France and England

Little by little the idea of the necessary war, of the almost desirable war, took possession of the industrial classes. The proof is found as far back as 1908 in a popularizer-book by Prof. Paul Arndt, one of those little 1 mark books which serve to shape German public opinion. All of us may reproach ourselves for not having read enough of these little books which would have warned us of the peril. In this book-

let the author opens with a pæan to German greatness followed by a chapter on "The Dangers of Germany's Participation in World Economics." He shows that such participation would increase the dependence of Germany upon foreign countries and render her vulnerable at sea as on land. If the international relations should be disturbed, there would then be "many workingmen without bread, many depreciated stocks for reasons which in great degree would escape all control by Germany," having their origin in countries which "could seize the occasion to weaken Germany." And with prophetic hypothesis he describes the effect of a blockade. But he accepts the risks of independent world politics without hesitation. "Surely," he writes, "if we want to be and remain a great people, a world power, we expose ourselves to serious conflicts. But this should not deter us. There is a profound truth in the saying that man becomes weakened by peace. Often the appeal to arms is needed to shake a world which has become stupefied in apathy and effeminacy. The battlefield appears often to those who see far and deeply as a blessing for humanity."

There is thus exposed, says Mr. Hauser in conclusion, the fatal mechanism of things by which the too-rapid industrial-

ization of Germany has led us all into the German war. If one were to doubt the part played by the economical causes, or rather the peculiar psychosis superinduced by these factors, it would be sufficient to observe in what manner the Germans in their day dreams imagine the victory of Germany. It is an industrial victory—the forced wedlock of German coal with foreign iron. It is the reduction of the other peoples to the rôle of perpetual vassalized customers of the German factory. The German dream is a business dream, a romance of the office.

V—The Fatality of Mushroom Growth

According to this dream the war shall also solve the colonial questions. As will be remembered, during the tragic days last July (1914) Chancellor Bethmann-Hollweg offered England the integrity of European France but refused to guarantee the colonies, especially northern Africa [with larger iron ore deposits].

The dream has vanished. The giddy edifice has crumbled, and once more the old proverb has been confirmed: Time does not spare what is made without its help (*Le temps n'épargne pas ce qui s'est fait sans lui*).

Longuemare Carburetor Now Made in America

New Model Has Slight Changes in Jet and Throttle—All Models 40 Per Cent Lighter than Last Year

THE Longuemare carburetor, which up to the present has been manufactured abroad and imported here, is now to have an American model, arrangements for manufacture at Syracuse, N. Y., having been completed by the Longuemare Carburetor Co., New York City. Some changes have been made to suit American requirements, and other changes which are general improvements in operation, fitting and assembling.

The waterjacket which surrounded the throttle has been dropped and there are two changes in the throttle valve. The opening *H* in the accompanying illustration through which the fuel is drawn in the idling position has been enlarged to permit a longer dwell, and another smaller hole at the left of *H* has been added to supply a little extra air when starting.

More Accessible Choke Tube

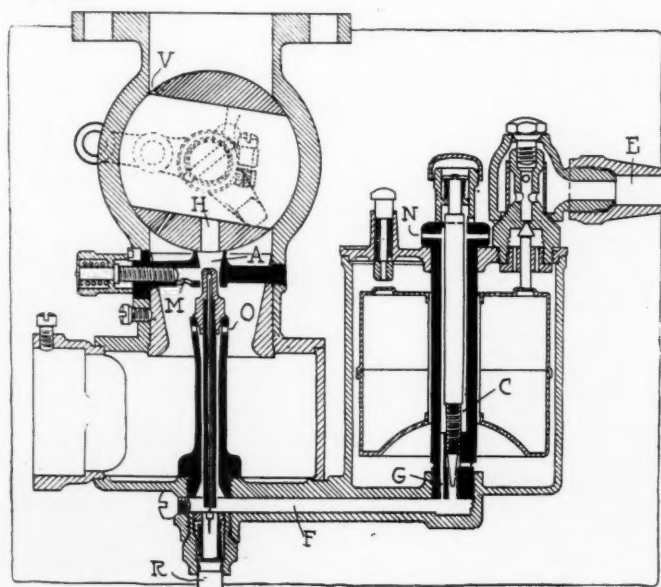
Other improvements are a more accessible choke tube which can now be withdrawn by removing a screw at the left, a swiveling connection of the float chamber to make the carburetor easily adaptable to any engine and the adoption of S. A. E. standard connections. The operation of the carburetor was described in THE AUTOMOBILE for Feb. 4, 1915, and remains practically unaltered. Gasoline enters by the needle valve through *E* and in passing the central adjustable needle at the base of the chamber fills the channel *F*. From here there is access to the compensating chamber *C*, which thereupon fills to the same level as the main float chamber. There are two jets, the main one *O* consisting of a few holes drilled horizontally at the top of the outer jet tube, and a central idling jet above it. Both are in direct communication with the channel *F*. When starting the throttle occupies the position shown with the opening *H* immediately above the idling jet. In this position there is practically no suction on the main jet. The air is drawn in past the idling jet through the inlet *M*, which is adjustable, the mixture passing the throttle by the small beveled opening *V*.

Automatic Fuel Regulation

When the throttle is opened the suction around the main jet increases but diminishes around the idling jet. A freer

flow of fuel being always required at this moment the compensating chamber *C* empties into the channel *F* supplying the extra fuel demanded by pick up. As soon as the chamber *C* is empty, air is drawn in through the openings *N* and passing through *G* mixes with the gasoline in *F*. In doing so an emulsion is formed which renders vaporization easy on issuing from the jet. An automatic regulation of the fuel supply is claimed for this carburetor through the action of this additional air in the following manner: The natural tendency on high speeds is to increase the richness of mixture. By introducing air into the gasoline on its way to the jet the density of the mixture is lightened thereby retarding the increasing flow of fuel from the float chamber. Thus the virtual effect is a thinning of the mixture at high speeds.

A cleaning device for the idling is incorporated in the form of a needle operated by the push button *R* underneath the jet.



Section through the latest Longuemare carburetor

ACCESSORIES

Cox Ford Safety Pilot

THE Cox safety pilot for Ford cars is a front axle and radius rod support combined with an automatic steering device. It is claimed not only to prevent the radius rod bending out of line and consequent breakage of the axle under strain but also to materially strengthen the car and to make driving safer and easier. The radius rod support is attached to the front axle and clamped to the rods near the apex of the triangle formed by their junction. The automatic steering device is attached just inside the radius rod supports on the axle connecting with the clamp of the radius rod. It is a strong, tempered flexible spring which acts as a stabilizer, preventing the car from swerving on rough or sandy roads and relieving the strain of a continuous tight grip on the wheel. The combination attachment sells for \$3.75.—Cox Brass Mfg. Co., Albany, N. Y.

Morris Dash Oil Indicator

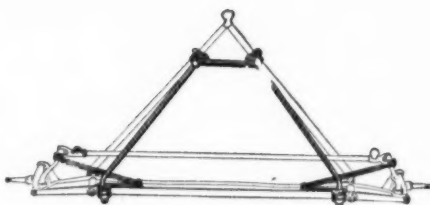
The Morris dash board oil indicator is for the purpose of showing how the oil pump is operated. It is adapted for both gear and plunger pump or where the flow of lubricating oil is constant and in considerable volume.

As will be noted from the accompanying illustrations, the plunger projects through the dash and its height indicates the quantity of oil which is passing through the outlet. There is a piston at the lower end against which the oil impinges to raise the plunger. On the lower end of the piston is a leather cushion which acts both as a silencer and a washer, and also effectually prevents oil being forced past the piston rod in case the delivery or discharge pipe should become choked.

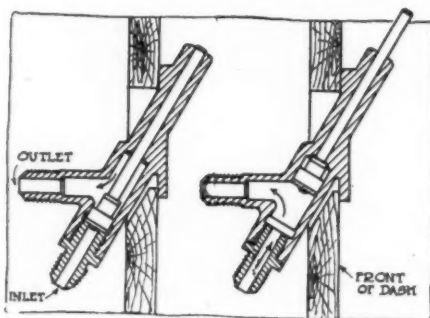
The flange for attaching the indicator to the dash can be of any desired diameter and at any angle to the axis of the plunger. The device is easily attached and is finished in nickel. The price is \$2.—George W. Morris, Racine, Wis.

Pasha Spark Plug

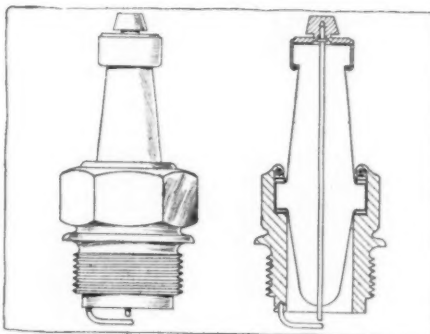
A sectional view is shown herewith of the Pasha spark plug. As will be noted, the central electrode is in one piece solidly baked in imported hard fire porcelain. At the top is the brass cap for a clip terminal, and no screw is provided. The shell of the plug is curled over to hold the porcelain tightly in position with spring tension. The points of the elec-



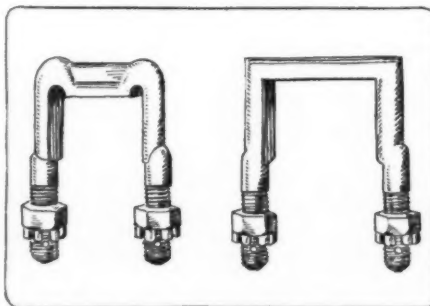
Cox safety pilot for Ford cars



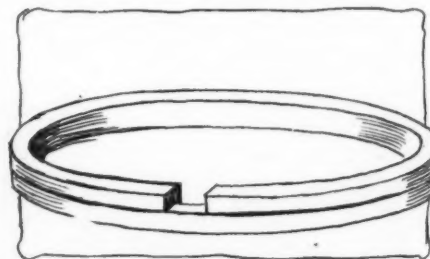
Morris dash board oil indicator



Pasha porcelain spark plug



Eccles front and rear spring clips



Randerson expanding piston ring

trodes are carefully finished, and in order to prevent leakage two copper asbestos gaskets are put above and below the porcelain flanges in the shell.—Pasha Spark Plug Co., Bloomfield, N. J.

Eccles Spring Clips

Front and rear spring clips for automobiles with special attention to the requirements of the Ford model T are listed. The spring clips are made in all sizes to fit all makes of cars, and are of such dimensions as to provide equipment for any desired spring. The price varies with the size and the pattern. They are made in half oval, full oval and flat designs, and are threaded drilled for cotter pins and equipped with castellated nuts, a pair being furnished with each clip. Twenty-five of these are packed in a box, and a representative price for Ford cars is \$75 per hundred.—Richard Eccles Co., Auburn, N. Y.

Randerson Piston Ring

This ring is designed to work against pressure on an entirely different principle than that employed generally in piston ring construction. The automatic ring idea is based upon making the ring act as a valve in the piston. The ring is so designed that when compression and explosion take place the ring is automatically expanded by the pressure which reaches back of the ring between the piston and the ring itself, thereby automatically expanding the ring against the cylinder wall. It is intended with the ring that no other ring need be installed in the piston.—Du Bois Machine Shop, Inc., Albany, N. Y.

Becco Tool Set

The Becco tool set consists of a steel case, with wood forms lined with felt and fitted with a selection of tools, each being held in place by a catch. The case is 15 in. long, 8 in. wide and 2 in. thick, and is finished in black enamel. The tools are as follows: Punch, cold chisel, cotter-pin remover, round file, flat file, file handle, large screwdriver, small screwdriver, hammer, large monkey-wrench, small monkey-wrench, three double-ended S-wrenches and a pair of combination pliers. Price, \$7.75.

Becco wrenches are made in sets held together when not in use by a special clip. The wrenches are of flat steel, non-adjustable. Two sets are turned out. Set No. 1 consists of four wrenches, all double-ended and one having two openings in one end and one in the other and one having alligator jaws. The sizes are from 5/16 to 11/16, and there is also a small opening for gas-tank valves. The steel used is 3/8-in. thick. Set No. 2 has the same number of wrenches, but the sizes run from 5/16 to 3/4; the alligator is the same size. The steel used is 5/32 in. thick. Set No. 1 is nickel plated and set

No. 2 is finished in black enamel. Price, set No. 1, 50 cents; No. 2, 65 cents.—Michigan Motor Specialties Co., Detroit, Mich.

Erickson Spring Separator

This tool spreads apart spring leaves and injects grease between them. It consists of a heavy steel rod with an adjustable sliding head, a stationary head carrying a screw and an intermediate sliding member movable toward or away from the adjustable head by means of the screw. As shown in the accompanying illustration, the screw-operated head has a hollow steel point which the screw forces between the leaves, the adjustable head being brought against the opposite side of the spring.

A large grease cup mounted at the top of the screw-operated head supplies the grease through the hollow steel point when turned, making a quick and clean job.

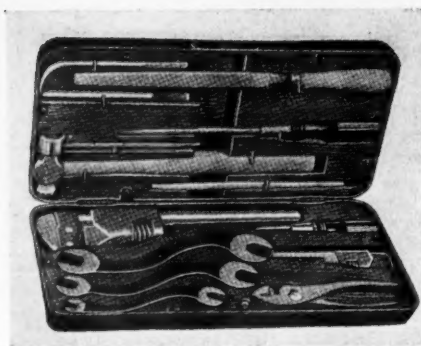
The screw-operated head is pressed out by a coil spring when the screw is backed off. The back head is adjustable for any width of spring. In case of breakage of the steel point, this can be readily renewed as it is screwed on. The device sells for \$1.—P. E. Erickson & Son, Inc., Port Chester, N. Y.

Aderente Non-Blinding Device

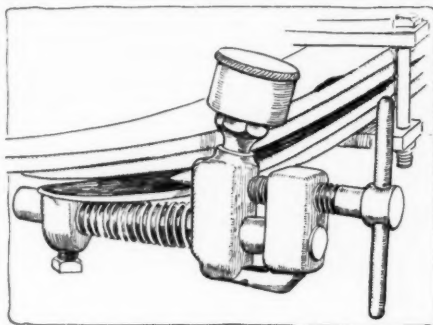
The Aderente is a non-blinding device which is so arranged as to cut out the glare and at the same time have many of the rays of light thrown directly ahead of the car in order to illuminate the roads. According to the manufacturer, the device is not a dimmer, but rather increases the power of the projected light by deflecting the rays to the road which would otherwise be thrown upwards or in a straight line ahead of the car, thereby blinding approaching pedestrians or drivers. The device is attached to the lamp door and although made of metal is said to have the appearance of cut glass. It does not require adjustment and does not have to be touched whether the car is being driven through the city streets or in the country. As the device is attached inside the door, it should not require frequent cleaning. The price per set of two, is \$3.50 and in ordering it is necessary to give the overall dimensions of the glass and door.—Aderente Non-Blinding Device Co., Inc., Jersey City, N. J.

Smith Encased Joint Pliers

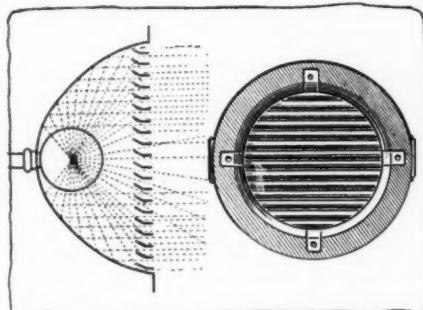
A new type of pliers, illustrated herewith, has been put on the market, having an encased joint, or one that is inclosed in contrast to the usual type which uses a lap joint and a rivet to hold the parts together. The new Smith pliers also employ a rivet but merely for the purpose of additional strength. Cutting can be done on both sides and it is claimed



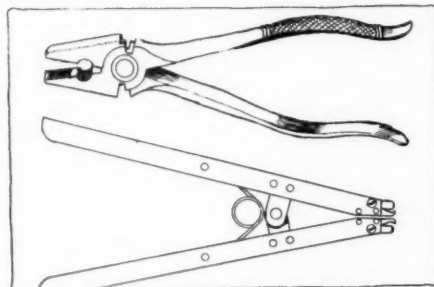
Becco automobile tool set



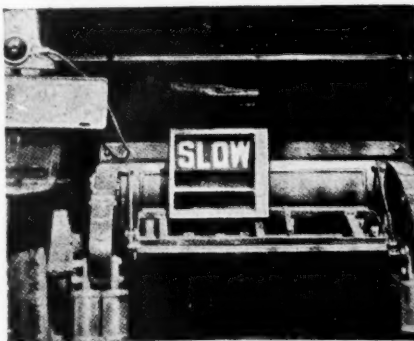
Erickson spring separator and lubricator



How Aderente non-blinding device operates



Above—Smith encased joint pliers
Below—Wilhelm piston ring remover



Vaughan safety signal on a car

that a small diameter wire can be handled as well as one which fills the cutting slot.—H. D. Smith Co., Plantsville, Conn.

Wilhelm Piston Ring Remover

The Wilhelm piston ring remover is designed to be of service in removing any style of piston ring. The device differs but little from the conventional type, depending for its spreading action on the bringing together of two rod ends, causing the opposite extremities to spread the ring ends, allowing the ring to be slipped over the piston top. As illustrated herewith, the Wilhelm consists of two bars pivoted to a common point near one end and connected by a spring which effects return action. The jaw is shaped so that it will not slip when used to spread diagonally split rings. Price is \$1.—Wilhelm Smith Machine Co., Reading, Pa.

Vaughan Safety Signal

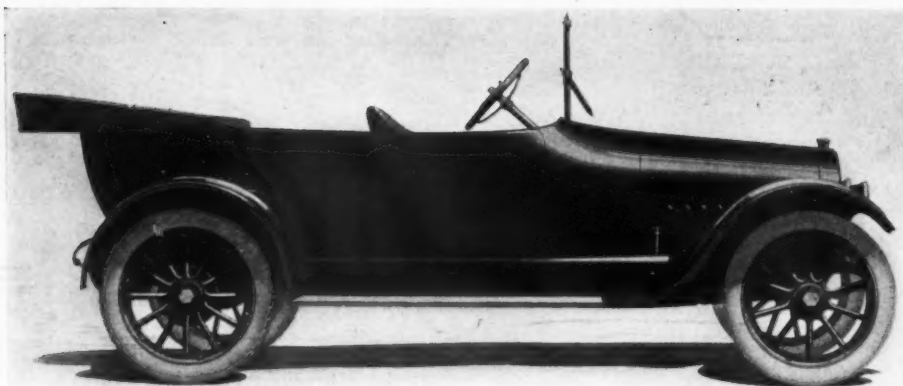
The Vaughan safety signal is of the rear-mounting type and is operated by a lever on the steering wheel, telling the driver of cars in the rear which way the machine which carries the signal is about to turn. The device consists of two plates mounted in a casing as illustrated, so that either side of the plates may be displayed. The words shown are: Turn Right, Turn Left, Slow and Stop, arrows being used to indicate the direction when the car is about to turn. Fiber gears in the casing operate the plates, Bowden wire connecting the gears to the control levers.—C. S. Vaughan, New Rochelle, N. Y.

Hertner Charging Outfit

The Hertner is a vertical motor-generator set with switchboard is for use in charging batteries from an alternating-current source. Being a motor-generator, it continues to run when the line voltage is cut off or drops for an interval, the generator acting as a motor with a slight draught of current from the battery until the line voltage comes on when the generator action is resumed.

In operation, the alternating current line is attached to the board, where it is controlled by a simple switch. The direct current line is at the bottom of the set. A feature of the Hertner outfit is the cooling fan mounted in the middle which is said to more than compensate for the slight amount of current used for this purpose by the results obtained.

In order to make the machine as well-balanced as possible and to make it run smoothly and also to render it possible to dismantle it readily, the motor and generator shafts are separate units and are connected by a coupling. A ball bearing immediately below this coupling supports both shafts midway between the top and bottom of the machine.—Hertner Electric & Mfg. Co., Cleveland, Ohio.



The new Paterson light six with high-speed motor listed at \$985

New Paterson Six Chassis

Four Continued with Improved Body Lines — Six Sells for \$985 — Uses New High-Speed Continental Motor

THE W. A. Paterson Co., Flint, Mich., will continue its well-known four practically unchanged for the 1916 season, the only alterations being in the body which has lines more in accordance with modern streamline ideas. The new six, however, is an entirely original job and the specifications show that it is remarkable value for the price of \$985. The motor is a Continental $3\frac{1}{4}$ by $4\frac{1}{2}$ in. and the body a seven-passenger with ample internal space and excellent finish. Wheelbase is 117 in., tires 32 by 4 in. and the equipment is extensive, one little detail of the latter especially worthy of mention being the utilization of the left front door pocket for tools most frequently needed. On lifting the flap of the door the most important tools are found, arranged each in a separate leather container so that any one required can be picked out in an instant.

Motor Is High-Speed Type

The motor has a formula rating of 25.4 hp. and a piston displacement of 224 cu. in. and is the type of Continental light six which was described fully on page 1130 of *THE AUTOMOBILE* for June 24, 1915. The engine is designed for high-speed operation, having its horsepower peak at about 2200 r.p.m. and developing 35 hp. at 1600 r.p.m. approximately. All the intake passages are integral, so the carburetor can be bolted directly to the casting, which is an excellent place from the warmth viewpoint and saves the need for a jacket. On the Paterson the standard carburetor will be a Stromberg, which seems to suit this motor very well.

Three-Bearing Crankshaft

There are three main crankshaft bearings, each being supplied with pressure oil from the plunger pump which is driven from the camshaft and located on the crankcase side. An oil lead also goes to the helical timing gears, and there are dip troughs for the connecting-rods. To eliminate vibration at the high speeds at which the motor is meant to be run, a large diameter has been chosen for the crankshaft, the main journals being $2\frac{1}{2}$ in. The left side of the engine is absolutely clean, save for the carburetor and the oil filler, while the water pump and the generator are arranged on the right side in such a manner as to interfere as little as possible with the valve accessibility.

Not long ago attention was called to the prevalence of heavy pressures needed for the operation of clutch and brake pedals on many cars. This important point has not been neglected in designing the Paterson with the result that the effort needed to release the clutch or to apply the service brake is amazingly small; so little, in fact, that a child could operate these controls. The clutch itself is a cone type with leather face and the Warner gear provides the usual three forward speeds, but here again, ease of operation has been studied, so that the gear shift lever moves proportionally as freely as the clutch pedal. This means that to change speed is as easy almost as to advance the spark lever which should make the Paterson very much appreciated in mountainous districts.

From the gearbox there is a single jointed shaft with its one universal designed to take the torque stress. That is to say the torque tube terminates at a bearing on the driveshaft just behind the universal, so the tube

withstands the stress of torsion at the point where it is greatest (near the axle) and only transfers the stress to the driveshaft close up to the universal and where the stress is at its lowest.

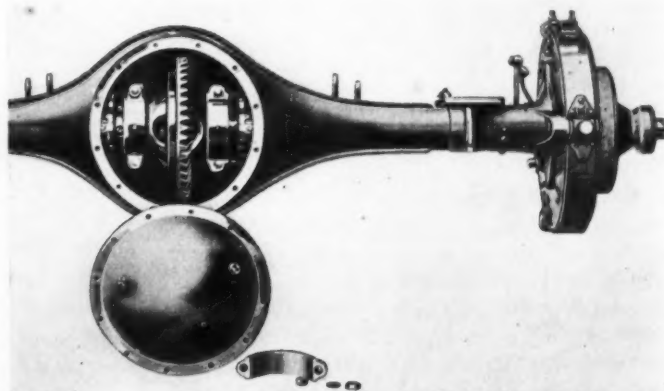
Rear Axle Accessible

For the rear axle a built-up construction is used, the differential and drive gears being mounted upon New Departure bearings, while Hyatt roller bearings take care of the support of the wheels and the driveshafts. These shafts can be removed easily, and the differential taken out through the rear part of the housing, without removing the axle from the springs.

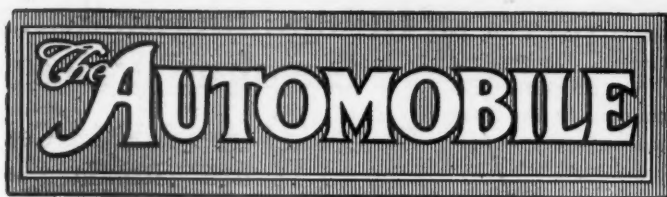
Rear springs are three-quarter elliptic with a large amplitude, giving easy riding, and the drive is taken through their front portions. The steering is laid out with good, straight connecting links and is irreversible by virtue of the Jacow worm and nut gear which is adjustable for wear.

In the body, width of seat is the outstanding characteristic, this being above the average, and upholstery is deep.

It is not quite certain at the time of writing, which of two electrical systems will be employed, but in either case there will be two units the generator having the ignition distributor integral.



Paterson rear axle from which differential can be withdrawn without removing the axle from the springs



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Valve Accessibility

WHAT is the real value of accessible poppet valves? It is a question that many an automobile engineer would like to be able to answer, and a question that opinion answers in many different ways. In most engines, whether V-type or L-head, the accessibility of the tappets is not really good, not good in the way that a spark plug is accessible, or even as is the jet of a well-placed carbureter. It is not to be questioned that the efficiency and the quietness of a poppet valve motor depends very greatly upon the accuracy of tappet adjustment, and it is a fact that, however good the materials, tappets will not operate long without wear. Yet it is often argued that the average man never bothers himself about his valves and depends entirely upon his repairman to overhaul all the valves at once when they get very bad.

This introduces the speculation of whether a very easily adjusted tappet would receive any more attention from most automobile owners than an entirely inaccessible push rod mechanism, and it is often contested that accessibility is not worth while because it is not made use of.

This seems a poor sort of argument. That a tappet should require adjustment is a fundamental fault of the engine, because the ideal machine should need no adjustments whatever. If it does need adjustment, as of course it always must, for the maintenance of any quality in performance, that adjust-

ment ought to be rendered as easy as possible. It is surely the manufacturers' duty to make automobiles with the maximum of convenience for the type of owner who treats his machine as it ought to be treated. It is not good business to excuse a poor design by a statement of belief that the average user is mechanically inept.

1916 Car Prices

FROM January, 1912, till January, 1914, the average price of automobiles rose from a little less than \$2,500 to a little above that amount. In January, this year, the price had fallen \$600, and so far as can be judged at the present time January, 1916, will show at least an equal drop.

Studying the curve it suggests that the great changes in equipment which took place from 1911 to 1914 pushed the average price to a peak, and this was a natural development. As the electric starting motor and other refinements became more settled things, it was natural that there should be a falling off in price, but the fall from 1914 to 1915 must show more than this. It can be accounted for only on the assumption that the manufacturers found they had set the price too high for the average buyer and the drop which took place last year was provoked by the desire to expand the market.

Now there is a limit to everything, and it is probable that we shall find January, 1916, will show a low spot in the curve that will correspond in years to come, with the high peak of 1914. This is surmise only, but the idea is fostered by the striking success of medium-priced cars. Any good car can be sold if it is cheap enough, and five-passenger cars at less than \$750 are bound to find buyers in very large numbers. Average price may fluctuate. It seems that the customer who wants to spend from \$1,250 to \$2,250 represents a large and permanent class so that there should be plenty of cars in this field for a long time to come.

Winning on Performance

THOSE who have waited to see how cord tires would work out in road races have the tire reports from the Elgin races, covering 600 miles spread over 2 days, a demonstration that indicates that the cord construction is apparently as well suited for high speeds on the average country road as on the brick or board speedways. The Elgin circuit is a typical country road, gravel surface well oiled, just such a road as can be found in thousands of places throughout the country.

One of the two winning Stutz cars made the 600 miles at an average speed of over 75 m.p.h. without a single change and the other Stutz changed but one tire in that distance. No longer are tires the determining factors in winning or losing they once were. In Elgin's 2 days of racing it was small mechanical troubles with cars, or lack of speed, that put certain cars back from first and second place. The winning cars won on good performance, freedom from mechanical troubles and not from handicaps imposed by tire troubles.

\$1,200,000 Co. To Build Cars

Buyers of Pope Westfield Plant Form Westfield Mfg. Co.

BOSTON, MASS., Aug. 20—A certificate of incorporation has been issued at Boston to the owners of the Pope plant at Westfield, who recently bought the property at public auction for \$725,000. The new company will be known under the name of the Westfield Manufacturing Co. and it will make automobiles. The capital is \$1,200,000. The petitioners for the charter are Richard Mortimer, Jr., W. B. Cook, J. B. Donovan and Richard Gregg, all of New York. It is understood these men are only representatives of the real owners.

The time for completion of the purchase of the Pope plant has been extended 30 days by Judge Aldrich of the U. S. district court. New York interests, headed by E. Preston Courson, were to have paid \$700,000 on Aug. 18, thereby completing the sale of the plant. The time has been extended until Sept. 16.

U. S. L. Gets Large Contracts

NEW YORK CITY, Aug. 21—The stockholders' protective committee of the United States Light & Heating Co. of Maine has issued a circular to holders of subscription-paid certificates of deposits for the stocks of the company, which states that all the claims against the old company have been paid and settled, excepting three or four, the validity of which is being contested.

The new company is now operating the plant and several new contracts have been secured. Two of the contracts call for \$9,000,000 worth of starters, delivered over a period of 3 years.

Traffic Managers Meet Sept. 14

NEW YORK CITY, Aug. 23—For the purpose of taking up the matter of delays in transit of automobiles, and to arrange the classification on automobile parts, a meeting of traffic managers representing all the automobile factories in this country that are members of the National Automobile Chamber of Commerce, Inc., will be held at the Board of Commerce Bldg., Detroit, at 10 a. m., Sept. 14.

Little Giant Six-Wheeler

CHICAGO, ILL., Aug. 23—The six-wheeled motor truck manufactured by the Chicago Pneumatic Tool Co.,

Chicago, under license from the Trailer Transportation Co., New York City, is now ready for the market. It consists of a 1½-ton Little Giant chassis and a two-wheeled trailer coupled to the rear thereof. A fifth wheel upon the trailer supports most of the body load, the front end resting on the load platform of the truck upon a ball-race so that it is free to move in relation to the truck. The fifth wheel arrangement, in conjunction with the steering draw-bar attached to the end of the truck frame, causes the trailing wheels to track exactly with the rear wheels of the truck. Thus the driver takes his turns just as sharply with the trailer as he would with the truck alone, although the load space permits of material 40 ft. in length being carried.

Ross Motor Sales Co. Formed

DETROIT, MICH., Aug. 23—The Ross Motor Sales Co. has been organized with headquarters in New York City to take the entire output of the Ross Automobile Co., which announced an eight-cylinder car the first of the year. This sales company is made up of eastern men, and includes T. C. P. Forbes, recently resigned as sales manager of the Monarch Motor Car Co., G. S. Patterson, and M. W. Kerr.

This company will undertake the entire distribution of the Ross cars for a period of 3 years, undertaking the advertising and selling campaigns, and freeing the factory here of anything save the making of the cars.

Clearing House for Truck Concerns in New York

NEW YORK CITY, Aug. 21—Emerson Brooks, formerly vice-president of J. M. Quinby & Co., Newark, N. J., and more recently in the motor truck field, has evolved a plan of operations which should be of value to the industry. In addition to the regular representation of one truck company, he has adapted his office to act as a sort of clearing house for companies which have no metropolitan agents. By such arrangement, he makes it possible for out of town concerns to arrange deliveries through his office, and also to have their catalogs and literature on file there. THE AUTOMOBILE, in its January issues, published tabulated statistics of 370 makes of trucks, many of them not represented in New York and this new plan should prove a convenience to them, as well as a source of profit. Mr. Brooks is well known in the automobile industry, having served two terms as vice-president of the Motor Truck Club and one year as treasurer of the Automobile Club of America. His office is at 250 West Fifty-fourth Street.

Independents Raise Gasoline Price

St. Louis Firms Add 1.1 Cents to Figure—Standard Oil Unaffected

ST. LOUIS, Mo., Aug. 21—After following the lead of the Standard Oil Co. nine times in the last 18 months by cutting the price of gasoline 1 cent each time, Independents here balked. They raised the price 1.1 cents this week.

The Pierce Oil Corp., which the Independents had termed an ally of the Standard Oil in stories of an alleged sham battle to freeze out the small dealer, announced increases in its gasoline prices soon after the smaller independents. The Standard, however, three days after the Independents' cut, had not yet brought down its prices.

The price of No. 1 gasoline was raised from 12.4 cents to 13.5 cents per gallon; No. 2 from 10.9 to 12 cents per gallon; No. 3 from 8.9 to 10 cents per gallon. These prices are for 10 gal. lots.

The Independent dealers say they expect the Standard Oil to follow their lead, and that they will continue to increase the price of gasoline until it is the same as before the so-called war, that is, from 15 to 17.5 cents per gallon according to grade.

The Independents denied that prices had been raised by agreement, although stories have been printed here of a recent secret meeting in Kansas at which it was said the increase was decided upon. There has been some talk of an investigation by State officials into these charges. Attorney General Barker announces that no request for an investigation has been received at his office and that until such a request is made his office for the present will not undertake an investigation.

Gasoline Advance in Eastern States

NEW YORK CITY, Aug. 23—Within the past week there has been a general advance of 1 cent a gallon in gasoline prices throughout New York State, New Jersey, New England, eastern Pennsylvania, and Delaware. The big companies are now selling gasoline wholesale in New York at 14 cents a gallon, compared with 11 cents in the early summer.

The Standard Oil companies affected by those changes are: Standard Oil of New York, Standard Oil of New Jersey, and Atlantic Refining Co. The Texas Co. and Gulf Refining Co. are quoting prices similar to the Standard.

The Independent oil companies in the St. Louis district have advanced the price of gasoline 1.1 cents a gallon to 13½ cents, for the best grades.

Yuster Axle Now Columbia

Combines Management of Output with Torbenson Co., Though Separate

CLEVELAND, OHIO, Aug. 20—The Yuster Axle Co., this city, manufacturer of automobile axles, has changed its name to the Columbia Axle Co. The business of manufacturing axles for high grade automobiles is to be carried on as heretofore, but a change of trade name has been thought advisable, owing to the withdrawal of W. L. Yuster from the company, and for the reason that arrangements have been made with the Torbenson Gear & Axle Co. of Newark, N. J., whereby that company has recently moved its entire plant, machinery, equipment and inventories to the Cleveland factory of the Columbia Axle Co.

Hereafter the combined product of both companies will be manufactured under one management and overhead expense in the same shop. It is believed that this step will add strength and materially improve the facilities of both companies whose separate identities are to be maintained, and at the same time prepare the foundation for extensive expansion of the business of each.

A New Building

Consideration is now being given to plans for a new building, and new machinery is being purchased to take care of increased business.

Owner Not Responsible for Disobedient Chauffeur in Accident

ST. PAUL, MINN., Aug. 14—The Minnesota Supreme Court has ruled that the owner of an automobile is not liable for the negligent acts of his chauffeur when committed while wrongfully operating the automobile outside the scope of his employment and, contrary to directions, for his personal affairs. E. A. Conrad of Minneapolis is relieved from payment of a judgment of \$2,100 allowed J. B. Provo in the lower court. The latter was run down by the Conrad chauffeur. Conrad directed his driver to go home for supper and then come back after him. The chauffeur went eight blocks out of the way on a mission of his own, when the accident occurred. The upper court held that as long as the driver did not obey orders no liability rests on the owner.

Trucks for Government in Mexican Disturbances

WASHINGTON, D. C., Aug. 21—War Department officials have been informed that Maj.-Gen. Frederick Funston, commanding the southern department, with

headquarters at Fort Sam Houston, Tex., has a plan for using motor cars extensively in the transportation of troops and supplies in Texas. He has recommended the purchase of four machines for use in rapid transportation between various points where it is necessary to maintain patrols, etc., it being stated that the disturbed conditions, due to marauding bands from the Mexican side, as well as bands of outlaws located in Texas, result in urgent calls for troops to meet emergencies at different places and that quick means of transporting troops and supplies from points on the railroads to places where they are needed in emergencies are absolutely necessary if the best results are to be obtained. Several trucks and cars are now in service along the Mexican border.

Now the Cummins-Monitor Co.

COLUMBUS, OHIO, Aug. 20—In accordance with the announced plans of developing the four and the eight-cylinder Monitor by the Cummins Auto Sales Co., Columbus, papers were filed with the Secretary of State changing the name of the present corporation to the Cummins-Monitor Co. The plant, where the Monitor is assembled, is located at 402-404 Mount Vernon Avenue.

Texas Co. Earnings Gain \$272,234

NEW YORK CITY, Aug. 23—The net earnings of the Texas Co. in 1915, the fiscal year ending June 30, shows an increase of \$272,234, while the surplus decreased \$242,647. The net earnings in 1915 amounted to \$8,024,692 and in 1914 to \$7,752,458. The company last year paid out \$3,000,000 in dividends, compared with \$2,550,000 in 1914.

Hupp Promotes Willemin

DETROIT, MICH., Aug. 23—A. B. Willemin, who has been director of purchases for the Hupp Motor Car Co. for three years, has been promoted to assistant general manager. He first entered the automobile field as purchasing agent of the Brush Runabout Co., later joining the Lion Motor Car Co. Subsequent to this he closed out the Elmore business for General Motors, and then came to Hupp.

Fuller & Sons to Add

KALAMAZOO, MICH., Aug. 23—At the last meeting of its stockholders, Fuller & Sons Mfg. Co., maker of automobile parts, voted to erect an addition to plant to take care of increasing business. This addition is to measure 100 by 61 ft., and four stories high. It is to be of reinforced concrete factory construction.

Trenton Body Builds

TRENTON, N. J., Aug. 23—Fitzgibbon & Crisp, Trenton, maker of automobile bodies, will build an addition to its plant.

N. Y. Exports to S. A. Gain \$809,277

South America Receives \$1,991,801 in Vehicles During Second Week of Aug.

NEW YORK CITY, Aug. 23—Passenger cars, to the value of \$672,262, and commercial vehicles, at \$1,319,539, left the port of New York during the week ended Aug. 14, 1915, as compared with only \$182,524 in passenger cars, in the same period in 1914. During the month of July passenger cars, to the value of \$72,350, were shipped from this port to the principal countries in South America. In point of value, Venezuela led with \$19,189, with Argentina next with \$16,858, Chile, \$13,665, Brazil, \$12,064, Uruguay, \$6,154, Colombia, \$4,260, and all other countries, \$13,224.

European Cars Lead in Big Cities of South America

RIO DE JANEIRO, Aug. 19—This city and Buenos Aires contain a large number of high-priced European automobiles, a certain barometer of the great and extravagant spending by the rich in these two South American metropolises. In the camps and the other capitals are to be found cars of a cheaper type, and here the low-priced American-made machines are very popular. Not so many, however, can be seen in the above mentioned cities as European makes, and many others have a strong foothold on fashion, and this is an extremely hard custom to break. The necessity of economy may do what selling agents have not been able to accomplish.

Motoring is the foremost in the list of amusements in Rio de Janeiro. The Brazilians have spent money lavishly on improving their roads, especially the famous Gavea-Tijuca drive, that follows the rocky coast for miles, and then spurts up into the mountains. This drive is 60 miles long. In Brazil, as in other South American cities, there is no law prohibiting speeding. People crossing the streets must look out for themselves if they wish to take a chance of being run down when the traffic is going the opposite direction. If a man is run down by an automobile, he is to blame for being in the way, not the driver, and if he has damaged the machine he can be sued by the owner.

Houk to Add

BUFFALO, N. Y., Aug. 24—The Houk Mfg. Co., Buffalo, has completed plans for an addition to its plant at Elmwood Avenue and the New York Central Railroad Belt Line.

Trade Review of the Week

Detroit Plants at Work on Fall Business—Material Shortage Continues

DETROIT, MICH., Aug. 24—Last week appears to have been up to the average of output and sales with the majority of the car and parts manufacturers of this city. Intensive buying of cars has been resumed throughout the country, from the indications that have come to the sales departments, this probably having a direct relation to the improved weather conditions that now obtain.

Fall Outlook Excellent

The recent resumption of manufacturing activity by the Ford Motor Co. after a shut down for inventory—the customary thing with Ford—has had its effect on several other of the city's manufacturing plants, a large part of whose output is sold to the Ford company, so that it may be said that practically every plant in the city is now quite busy with the early fall business. The outlook for fall trade is regarded as excellent in all quarters, and everywhere there is a strikingly optimistic trend, all the big producers thinking that they will be able to make and sell enough more vehicles than last season to make up for the almost general reduction of prices.

In some quarters the shortage of raw materials is still worrying. One motor maker, for instance, says that he has been obliged to turn down many orders for engines because of the shortage. In some lines, he says, it will take many months to get a normal supply, and that it would be folly to accept contracts specifying dates of delivery, when he knows that the necessary material is not on hand, and will not be for some time. War business in steels, brass, aluminum, etc., curtails greatly the amount available for domestic use, and prices have felt the increasing demand. Pig iron, among others, is higher, and desired deliveries are hard to get. This shortage is apt to affect the smaller consumer before the large buyer, and the larger concerns are able to get fairly reasonable attention through their large buying power.

Dealers in this city and vicinity are well satisfied, on the average, with the amount of business either in sight or already closed. They say that there was a perceptible picking up during last week, with most of the days clear. People will not buy cars when the weather is bad.

New York Sales Good

NEW YORK CITY, Aug. 24—Sales conditions last week in this city showed the

same inquiry on the part of prospective buyers as in former weeks. The dealers have the same complaint to make—completely sold out and no new cars in sight until the last of September. A few of the dealers were, however, more fortunate this week in the way of shipments. The Studebaker factory has adopted the plan of consigning two trainloads of new models each day to its branches, from which the cars are passed along to dealers. Accordingly last Monday, two trainloads started for the Atlantic coast, for distribution among dealers tributary to those branches. Tuesday two more trains were under way and on Wednesday another double trainload was sent out, this program to continue until each branch house will have received its quota of cars. The Maxwell agency received two carloads yesterday and expects that number each day to the end of the month. Sales to date this month for the Maxwell in this city have numbered sixty-nine. The Stutz agency received a fresh shipment from the factory but not enough to make full deliveries on, its sales last week numbering fourteen.

Influence of War

A few of the agents report slack business on account of scarcity of cars and also on account of the closing of the vacation period. Dealers state that there have been more people in this city this year than ever before, and consequently many sales have been made. Most of these visitors were people who usually go to Europe for the summer. This year, a majority of them have turned their attention to touring and while in this city, have bought new cars for that purpose.

The dealers, however, are expecting a rush for cars in about a month, when there will be a demand for winter models. Harry S. Houpt is anticipating this demand by having on exhibition on Sept. 1, a complete line of closed cars. The Pierce people state that most of their sales have been in closed cars. Sales last week numbered nine, as compared with one during the same period last year.

The Mercer company is sold out and will not be able to make deliveries until October, when the new series will be out. It states that if it could have had the cars, 100 could have been sold.

The Oldsmobile agency sold twenty-five cars last week. Shipments are fair.

Oklahoma's Prospects Rosy

OKLAHOMA CITY, OKLA., Aug. 20—The automobile buying possibilities in the State of Oklahoma this year are better than in the history of the new State. At present there are 32,000 automobiles in the State, according to the estimated figures of the State highway

department. If abundant crops, heavy production of oil, gas, coal, lead, zinc and other minerals have anything to do with automobile buying the business in Oklahoma this year will grow by leaps and bounds.

45,000,000 Bushels of Wheat

Wheat is a big money crop in Oklahoma. This year the yield will reach 45,000,000 bushels. It is selling for more than \$1 a bushel, therefore the money from this crop alone will be in excess of \$45,000,000. Oklahoma this year raised 80,000,000 bushels of corn, which brings about \$65,000,000 to the farmers.

Oil is Oklahoma's greatest money "crop." Oklahoma produces more oil than any other State in the union, according to the report of the State geologist. For two years the price of oil dropped off to 40 and 50 cents a barrel, but within the past two weeks the price for crude oil has been advanced 20 cents a barrel, increasing the price to 60 cents. The history is, when the price of oil is lowered, the buying companies decrease the price 5 and 10 cents a barrel at a time. And, when it is advanced, the price is increased 5 and 10 cents a barrel. The producers have resumed work in all the fields of the State, in anticipation of dollar-a-barrel oil in the near future.

Oklahoma coal sells for many million dollars every year; her zinc, and other minerals, sell for millions; and the oat crop this year will bring in at least \$20,000,000.

During the past year, Oklahoma automobile dealers have enjoyed the biggest business in the history of the State.

Oklahoma to Tax \$25 for Failure to Register Cars

OKLAHOMA CITY, OKLA., Aug. 23—Automobile owners of Oklahoma, those who have failed to get a new 1915 license tag, were warned by State Highway Commissioner George Noble to pay the tax on or before Sept. 1 or they will be subject to a fine not to exceed \$25. The warning was directed especially to automobile owners in Oklahoma who are delinquent.

"There are 500 or 600 cars in Oklahoma City that have not been registered," said Commissioner Noble to-day.

According to Mr. Noble, not more than half of the cars in Oklahoma have been registered with the highway department. On the records of his office there are accounted for a few more than 13,000 automobiles, 600 motorcycles and 300 traction engines. Commissioner Noble estimates that there are from 22,500 to 25,000 automobiles in Oklahoma. He said, however, that he would not be surprised if there were 30,000 to 32,000 cars here. His first estimate placed the number at the latter figure.

Niagara Four To Sell At \$740

Niagara Automobile Co. Formed in Buffalo—Capital To Be \$500,000

BUFFALO, N. Y., Aug. 24—The Niagara Automobile Co. has been formed here to manufacture the Niagara four-cylinder five-passenger car to sell for \$740. G. H. Poppenberg is president of the company, with W. G. Miller as vice-president and general manager, and Albert Poppenberg, secretary and treasurer. The plant of the company, which is to be capitalized at from \$500,000 to \$750,000, will be located in Buffalo and it is the idea of the promoters to use materials produced either in Buffalo or its vicinity. The new car will be light in construction.

Mr. Miller was associated with the Pullman company and other automobile concerns for many years, while the Poppenbergs are local business men.

Must Have Personal Representation to Sell Cars in China

SHANGHAI, CHINA, Aug. 2—It has been demonstrated that in order to secure profitable results American firms which contemplate engaging in the export trade would do well first to secure personal representation in the market they intend to enter. A new firm entering the field would be somewhat handicapped if it depended absolutely upon an advertising campaign to create a demand for its products.

China is considered a great possible market for automobiles, and recently a representative of a prominent firm of automobile manufacturers in the United States, who is now visiting Shanghai, appeared optimistic as to the future possibilities of this trade not only in China but also in other countries of the Far East.

The smaller type of touring cars, those of four or five-passenger capacity, seem to hold most favor. The touring car of seven or eight-passenger capacity, numbered among which are some of the recent eight-cylinder models, and the limousine type, seem to be popular. There are about 600 cars in Shanghai.

Motor Vehicles in the State of Kansas Valued at \$19,814,116

TOPEKA, KAN., Aug. 25—Some very interesting facts concerning the use of motor vehicles in Kansas are revealed by the assessors' reports. Kansas is now paying taxes on \$19,814,116 worth of passenger vehicles, for instance, against a valuation of \$6,192,224 7 years ago—and during that time the valuation of carriages has declined from \$5,077,399

to \$3,045,290, indicating the tremendous increase in the comfort and pleasure of the citizens from the availability of motor vehicles. It can fairly be estimated that fully \$10,000,000 was spent for automobiles that would not have been spent for any sort of conveyance except for the development of the automobile. What this signifies for the added facility of inter-communication among the residents of the smaller towns and farms of Kansas, and their improved social and commercial conditions, can scarcely be estimated. The value of automobiles has jumped in the 7 years from \$1,056,913 to \$16,298,763, and their number from 2156 to 48,261. There were no motorcycles listed in 1908—their value now is \$425,913. The value of bicycles has dropped from \$57,912 to \$44,145. There has been a small increase in the number of horses in the 7 years, from 1,035,878 to 1,053,753, and a decline of 400,000 in the number of cattle, to 2,393,427. Mules have increased from 169,526 to 274,826—and these figures are well to keep in mind in the next 7 years, during which the recent exploitation of tractors for farm use will be having its effect.

New 4-Wheel Drive Truck

ST. PAUL, MINN., Aug. 25—The Twin City Four-Wheel Drive Co. has bought the J. L. Ware patents for trucks. The company is capitalized at \$500,000 and opened temporary quarters at 2324 University Avenue. The company has 200 ft. frontage of property in the vicinity, and plans are being drawn for a three-story office and factory building. Officers elected are: President, J. L. Ware, Minneapolis; vice-president, T. J. McDermott; treasurer, F. J. Drew, Minneapolis; secretary and general sales manager, M. T. Roche. It is the intention to have trucks ready in 1916.

Russell Plant Making Shells

TORONTO, ONT., Aug. 20—The Russell Motor Car Co. of Canada has started the manufacture of shells for the British Army, a contract having been signed through the shell committee in Canada. This order will keep all the available plant working to capacity until about the end of the year.

Federal Rubber Holds Outing

MILWAUKEE, WIS., Aug. 23—Eight thousand two hundred and fifteen persons attended the annual outing given by the Federal Rubber Mfg. Co., Milwaukee, to its employees and their families at Waukesha Beach on Aug. 21. It was the largest outing ever given by the company, and one of the largest crowds that have ever attended a picnic given by any Milwaukee industry to its forces. It required eighty-two large interurban street cars to convey the crowd to the beach.

Hollier 8 to Double Output

Buys Plant of Harris Bros., Chelsea, Mich.—To Build 20,000 Cars

DETROIT, MICH., Aug. 25—*Special Telegram*—The Lewis Spring & Axle Co., Jackson, Mich., manufacturer of the Hollier eight, has purchased from Harris Brothers Co. the plant at Chelsea, Mich., which was formerly occupied by Flanders Mfg. Co., for the manufacture of motorcycles. The plant is completely equipped with machine tools, and can be put into manufacturing condition easily. The Lewis concern intends manufacturing complete cars both in this new plant and in main factory at Jackson. Purchase will practically double the Hollier output, making it possible to manufacture from 20,000 to 25,000 cars in the two plants.

Hamilton Beach Co. Will Build

RACINE, WIS., Aug. 21—The Hamilton Beach Co., Racine, Wis., manufacturing small electric appliances of all kinds, will break ground in about 10 days for a plant of its own on High Street and the North-Western tracks at Racine. The company has been occupying leased quarters in the works of the F. J. Greene Engineering Works for several years, and recently was obliged to take additional space in the Racine Stool Co.'s plant because of an unprecedented rush of orders. The decision to build a plant of its own followed the receipt of several large contracts for electric motor devices from the automobile and sewing machine industries. Frederick Osius is general manager. The Green works, which have much to do with the automobile industry, will immediately occupy the space vacated by the Osius concern.

Globe Seamless Tubes Co. Adds 100 Men

MILWAUKEE, WIS., Aug. 25—The Globe Seamless Steel Tubes Co., Milwaukee, a large producer of steering gear tubing, boiler flues, axle shafts, driveshafts, etc., has added 100 men to its forces and extended its schedule to a 24-hr. day to meet the extraordinary demand for its goods. The principal source of the demand is from the motor car and farm implement industries.

7000 Cars in Manitoba

WINNIPEG, MAN., Aug. 20—Over 7000 automobiles have been registered in Manitoba this year, according to returns at the Parliament Buildings. This represents a considerable increase over the number registered during the same period last year.

Perlman Wins Decision in Long-Contested Demountable Rim Patent Suit

Court Decides Patent Shows Invention—Declares Standard Welding Co.'s Rim Infringes and Issues an Injunction—Orders Accounting

NEW YORK CITY, Aug. 19—Judge Hunt yesterday handed down a decision in favor of Louis Perlman in his suit against the Standard Welding Co., charging infringements of claims 8, 11, 12 and 13 of patent No. 1,052,270 covering demountable rim construction. The Court issued an injunction restraining the Standard Welding Co. from making or selling rims alleged to infringe Perlman's patent and ordered an accounting of the concern's profits therefrom.

Suit Filed in 1913

The patent No. 1,052,270 involved in the suit, which was filed Oct. 7, 1913, in the United States district court for the Southern district of New York, was issued to Perlman on an application filed June 29, 1906, which was a continuation of and substitute for an application filed May 21, 1906. The object of this patent, as outlined in Judge Hunt's opinion, was to provide "a demountable rim sustaining a tire capable of ready application to and removal from a fixed rim and felly of a wheel, the demountable rim being so constructed as to facilitate application and removal of the shoe. Means are provided for firmly and rigidly retaining the demountable rim on the fixed felly and rim while in use. The fixed rim has an annular flange on one edge. There are threaded apertures in the body of the fixed rim intermediate at its edges through which are threaded bolts formed with a frusto-conical entering end. The demountable rim, which is slid onto the fixed rim from the flangeless side of the latter, has conical or frusto-conical apertures into which these bolts enter and lock the demountable rim firmly in place. Locking nuts prevent the loosening of the bolts. The bolts serve as connectors between the wheel body and the demountable rim, and are adapted to exert outward pressure on the latter. The demountable, or tire-carrying rim, is made in two sections, each of which is cut away for a portion of its thickness, forming an annular shoulder, and one of which overlaps the other for the width of the cut-away portion, with the free edge of each lapping portion engaging the shoulder of the other. These shoulders are secured together by screws. Each section has at its outer edge a clincher flange curved to produce an annular groove to receive the annular beads of the tire shoe. The demountable rim has an aperture for the

valve stem and the fixed rim and felly have a notch into which the stem enters. Short-stem lugs designed for use in connection with a detachable operating tool are employed to engage the tire tool and press it into position with its beads on the grooves of the flanged edges of the rim. The tire-carrying rim is of such diameter as to be easily slipped over the fixed rim, the valve stem as it enters the notch in the fixed rim serving as a guide for the proper positioning of the demountable rim on the fixed rim. When the radial bolts are screwed into the conical openings, and the nuts are tightened, the demountable rim is fast on the wheel. The bolts cause the demountable rim to be moved radially away from the fixed rim and also laterally against the annular flange of the fixed rim. A witness of the plaintiff testified that the bolts also serve to prevent the demountable rim from creeping or rotating upon the body of the wheel."

Perlman's Contention

According to the opinion, Perlman's contention was that each of his locking elements consists of a wedge acting against an inclined space of a demountable rim and driven by a power element which anchors the wedge to the wheel; that the fact that the inclined space is that of a conical opening is merely an incident not altering the dual action of the locking element; that the wedge is the tapered end of a bolt, and the bolt itself the power means; that the locking means consists of a series of wedges and that the bolts which carry the wedges are the actuators; that each bolt in the Standard Welding Co.'s device is threaded through the wood felly and fixed rim and has a movable rim which actuates the wedge and that there is but a reversal of parts with the same functions attained in the same way as with the movable bolt in a fixed nut actuating a wedge; that the immediate actuator of the wedge in the Standard Welding device is a nut threaded on the bolt and that there is no substantial distinction between moving a wedge by threading a bolt through a stationary nut, as in the Perlman device, and moving a wedge by threading a nut along a stationary bolt as in the Standard Welding construction.

Claims of the Defense

The Standard Welding Co., contended that in 1906 and 1907 with other manu-

facturers of automobile wheels and rims in this country, it began to make what is known as the "Old Style Continental Demountable Rim," the characteristic features of which are substantially those of the exhibit introduced by Perlman as the Standard Welding Co.'s wheel. The company also stated that the construction of this wheel was an adaptation of one previously produced commercially in Europe and particularly in France where it was known as the Vinet demountable wheel. The Standard Welding wheel has ordinary spokes and wood felly and a fixed metal felly band with an upturned flange on the inner side. There is an opening in the felly and band to receive the tire valve stem. The clincher demountable rim has a block fitting between two plates on the fixed rim so that they will not creep. The demountable rim has a series of holes for nuts for short-stem lugs and also with a valve stem hole. There are eight locking devices, these consisting of a bolt and a metal wedge, the bolts passing axially through the wood felly and each having a head on its inner end so shaped as to prevent its rotation. There is a nut on the outside end of each bolt. The wedges go between the demountable rim and the fixed rim and exert an inclined pressure upon the demountable rim radially away from the wheel body, spacing it from the fixed rim, and also press it laterally against the flange at the other end of the fixed rim. The wedges are propelled by threaded bolts, the immediate actuators being a nut threaded on a bolt.

Similarity of Construction

The Court ruled that "the same result is accomplished in both devices, a demountable rim is supported on a small amount of surface and is capable of ready application and removal, and yet is firmly locked on the fixed rim while in use. While in the case of one there is a bolt with a frusto-conical end which enters a conical cavity in the demountable rim, and in the other (a) a bolt which enters the felly axially and (b) a wedge plate, in each there is produced this effect: Radial pressure outward from the wheel body, and lateral pressure against the curved flange of the fixed rim is exerted on the demountable rim. The demountable rim of the defendant, like that of the plaintiff, is of rolled sheet metal, comparatively thin, capable of an amount of distortion, yet sufficiently rigid to carry the full load between the points of support. Again, the demountable rim of the defendant is cylindrical, like plaintiff's, is made so as to have certain spaced inclined surfaces engaged and locked by small wedges like plaintiff's and provided with locking wedges for engaging the rims at spaced points, the wedges being constructed to present the least amount of surface in contact with the rim.

"I can perceive no distinction in function between the two wheels and as a fact the question that presents itself is whether or not such a similarity exists between the patented device and the defendant's wheel to sustain the claim of infringement."

The Short-Stem Lug

The Court then takes up the question of invention in the use of the short-stem lug by Perlman, pointing out that long-stem lugs had been in use for some time previous to his conception of the possibility of the use of the short-stem variety by the use of a detachable handle and comes to the conclusion that "the device of Perlman was a practical solution of the problem of replacing a deflated automobile tire in a quick and easy way." The Court also mentions the early activity of Perlman about 1900 in endeavoring to devise a way of facilitating tire replacement on the road and reviews the steps of his invention, taking out of patent, etc. In regard to the alleged prior art cited by the defendant, the Court ruled that either of these were foreign to the matter or not of such a character as to invalidate Perlman's invention. As for Q. D. rim devices, the Court states that these are based upon having a close, continuous bearing contact with all possible surface of the tire against the bed, whereas the principle applied in the demountable rim art is just the reverse.

In reference to the French patent to Vinet, No. 347,651, issued Nov. 4, 1904, the Court says, "The plaintiff should not be defeated by reference to the Vinet patent because the evidence convinces the Court that the plaintiff has proved his invention as antedating the foreign publication of date March 18, 1905."

The opinion continues, "the evidence satisfies me that in 1903 plaintiff completed, and in 1904, in a successful way, operated his invention."

In reference to the steps taken by Perlman to obtain recognition from the patent office, the opinion says, "Many claims were presented and many canceled and yet I find no claim of the same scope as the claims of the patent and none, which, being conceded to be non-patentable, can be construed as an estoppel against Perlman's right of protection against infringement by a rim wheel, demountable, embodying locking elements placed to press the demountable rim radially outward and thrust it at right angles to the radial action in the final or operative position and to lock there tensioned during use, but capable of being readily released from tension, allowing the rim to assume a loose position before it starts to move off the wheel."

"I find claims 11, 12 and 13 of Patent No. 1,052,270, which are directed to the

demountable rim locking means and the combination thereof, with a wheel body and its demountable rim, are infringed."

"Claim 8 relating to the wedge-shaped clamping plate for clamping the clincher bead of a tire, and the combination therein set forth, is for a device used with defendant's structure when the apertures and recesses of defendant's demountable rim are made use of at all. The evidence shows that the depressed portions in the median line of defendant's demountable rim, each of which is apertured centrally, is of no utility except when employed for receiving the nut of a short-stem lug with the stem of the lug extending through the aperture, and the apertures are used in no way other than to receive a short-stem lug. The combination set forth in Claim 8 is present in the parts furnished by the defendant as if the complete combination were sold by it."

Features of Invention

"Finally, Perlman's patent shows invention, completed by him in 1903. Two distinct features mark the inventions: (1) The demountable rim combination with its locking means; and (2) the short-stem lug combination for clamping the tire to the demountable rim. The invention claimed was based upon a provision for a demountable rim which is loose on the wheel when applied, but is locked by locking means which may be unlocked and thereby may restore the loose condition before commencing removal. This same combination has been adopted by defendant and the same combination as disclosed and claimed in the patent in suit has been taken. Plaintiff disclosed to the defendant the patented invention before defendant began to manufacture demountable rims."

"The evidence requires the finding of infringement and the granting of an injunction and accounting in usual form."

Claims in the Suit

The claims of the patent involved in the suit, 8, 11, 12 and 13 read as follows:

"8. The combination of a demountable rim having radially disposed clencher flanges, a tire shoe having beads engaging said flanges, a wedge-shaped clamping plate bearing against said beads and adapted when moved to force said beads against said flanges, and means accessible from the inside of the rim for drawing the clamping plate radially toward the rim."

"11. The combination, with a wheel body, of a demountable rim therefor, a locking element, have a tapering portion, that is adapted to be moved radially and to thereby exert pressure against the rim outwardly radially of the wheel body, and to act as a wedge laterally, said locking element having an engagement with the wheel body whereby it may be moved radially of the wheel body."

"12. The combination with a wheel and its felly of a demountable rim therefor, a locking element having a

Detroit S. A. E. Is in Own Home

Headquarters Large Enough for Committee, Though Not for Section Meetings

DETROIT, MICH., Aug. 23—The Detroit Section of the Society of Automobile Engineers, though it has been located in its own headquarters since May, is making public announcement of the fact that its permanent headquarters are at 601 Kerr Building. While the new office is not large enough for the section meetings, it is of sufficient size for any committee gatherings, and a permanent office of this kind is of great value, the section previously having no established headquarters.

This is the first section to have a home of its own, and also one of the few to have a salaried secretary, the financing of this as well as the office being carried on by private subscription among the manufacturers.

New 1-Ton Garford

NEW YORK CITY, Aug. 24—The Garford Motor Truck Co., Lima, Ohio, has brought out a new 1-ton truck similar to the 1½-ton model. It differs from the worm-driven 3000-lb. vehicle only in the size and strength of principal parts. The main characteristics of the 1-tonner are: capacity, 1 ton; price, \$1,450; wheelbase, 120 in.; tires, front, 34 by 4½; tires, rear, 36 by 4; drive, worm. The motor is located under the hood with the radiator in front and is the same one used in the ¾-tonner. It is mounted direct on the main frame and is assembled with the clutch and gearset in a unit power plant. The motor develops 19.6 hp., its bore being 3½ and stroke 5½.

Smith with Chalmers

DETROIT, Aug. 23—F. H. Smith, formerly with the Studebaker Corp., and later northwest district manager for the Hudson Motor Car Co., has joined the Chalmers Motor Co. as special representative.

tapering end that is adapted to be moved radially and to thereby act as a wedge laterally and exert pressure against said rim radially of the wheel, said locking element having a threaded engagement with the wheel structure whereby it may be moved radially of the wheel."

"13. The combination with a wheel body, of a demountable rim therefor, and a locking element, having a tapering portion, that is adapted to be moved to exert pressure against the rim outwardly radially of the wheel body, and to act as a wedge laterally, said locking element having an engagement with the wheel body."

the age of sixty-five years, if retiring, and that the retirement on pension becomes compulsory at the age of 70 years. The pension will be based on the annual wage at the rate of 1 per cent per year employed, so that a workman employed continuously for twenty years will be pensioned at 65 or 70 years of age at the rate of 20 per cent of the annual wage. The maximum pension to be allowed is \$50 a month and the minimum \$18 per month. The company immediately pensioned twenty aged men who have served thirty to thirty-four years.

Six-Story Addition for Dodge

DETROIT, MICH., Aug. 20—Dodge Bros. are having plans prepared for a large addition to the present factory. The new structure will be in conformity with the other modern concrete and glass buildings of the Dodge groups, and will be about 600 ft. long by 80 ft. wide, and six stories in height. Information as to what this additional space will be devoted to is not available at this time.

Goodrich May Purchase Akron Plant

AKRON, OHIO, Aug. 20—It is believed that the American Hard Rubber Co., the plant of which is now completely surrounded by buildings of the B. F. Goodrich Co., will move to a new location between Campbell and Bartges Streets giving up its present location for the expansion of the Goodrich company. The Goodrich company has been wanting to purchase the plant of the American company for some time and it is believed an agreement has been reached, although neither would verify the report.

Security Prices Are Dull

Loss of Arabic Checks Optimism—Losses Range from One-Half to Fifteen Points

NEW YORK CITY, Aug. 23—The heaviest decline in stocks since the Lusitania was sunk took place at the opening of the market to-day when news of the sinking of the Arabic was heard. While many stocks broke two to fifteen points the heaviest loss was sustained in the common stock of the Willys-Overland Co. which dropped fifteen points. Nervousness was evident throughout the commission houses, but heavy buying left the price list well above the lowest figures. Naturally, the stocks that had scored the most extensive advances in recent days were the heaviest sufferers.

Heavy Declines

Studebaker, which had risen more than thirty points in ten days, dropped back seven and a half points in the first sale, and General Motors fell nine points in a few days. Goodrich went down five points. In many respects the resiliency of stocks under the stress of bad news brought encouragement to partisans of the constructive side of prices. The rapid rise of certain war issues, stocks of companies which had received large orders for munitions, had called forth from market observers earlier in the week warnings that unfavorable developments might easily cause a serious setback. The decline was not considered

of a grave nature, and the latter action of prices showed that urgent selling had quickly been checked.

The Detroit market was unsettled throughout the last hour of trading and was subjected to renewed pressure wholly apart from the Arabic incident. Reo Motor Truck Co. advanced from ninety-five to 107 points, a total gain of twelve. The rest of the active stocks remained quiet. In the inactive stocks the Ford Motor Co. of Canada made a gain of fifteen points. Atlas Drop Forge Co. rose two points. The bond markets were quiet with no trading in sight.

Ford's Washington Plant Started

WASHINGTON, D. C., Aug. 22—Work of excavating for the foundations for the new assembly plant of the Ford Motor Co., at Pennsylvania Avenue and John Marshall Place, has been started. The building will be six stories in height and will be 139 ft. on John Marshall Place and 165 ft. on Pennsylvania Avenue. The cost will be about \$400,000. Pending the erection of the building the Ford Motor Co. has taken two floors of the Union Garage.

8200 Men on Packard Payroll

DETROIT, MICH., Aug. 20—The Packard Motor Car Co. is now employing a greater working force than ever before in its history. The payroll now totals about 8200 men, who are entirely devoting their attention to the various phases of the production of the new twin six and to the manufacture of the Packard truck.

Automobile Securities on New York and Detroit Exchanges

	1914		1915		Wk's
	Bid	Asked	Bid	Asked	Ch'ge
Ajax-Grieb Rubber Co. com.			300		..
Ajax-Grieb Rubber Co. pfd.			101	110	..
Aluminum Castings pfd.			100	103	..
J. I. Case pfd.			70	79	..
Chalmers Motor Co. com.			89	92	+2
Chalmers Motor Co. pfd.			94	97	..
Electric Storage Battery Co.			62½	63	..
Firestone Tire & Rubber Co. com.			518	525	+8
Firestone Tire & Rubber Co. pfd.			111	..	..
Garford Co. pfd.			202	207	-16
General Motors Co. com.			106	107	-1
General Motors Co. pfd.			53	57	-3
B. F. Goodrich Co. com.			107	108	-10½
B. F. Goodrich Co. pfd.			271	275	+3
Goodyear Tire & Rubber Co. pfd.			108½	110	..
Gray & Davis, Inc. pfd.		
International Motor Co. com.			23	25	-2½
International Motor Co. pfd.			50	52	+1½
Kelly-Springfield Tire Co. com.			174	177	-10
Kelly-Springfield Tire Co. 1st pfd.			85	87	-1
Kelly-Springfield Tire Co. 2d pfd.			170	180	-10
Maxwell Motor Co. com.			40	41	..
Maxwell Motor Co. 1st pfd.			86	87	-½
Maxwell Motor Co. 2d pfd.			34	35	-½
Miller Rubber Co. com.			..	195	..
Miller Rubber Co. pfd.			107	107½	..
New Departure Mfg. Co. com.		
New Departure Mfg. Co. pfd.		
Packard Motor Car Co. com.			112	119	..
Packard Motor Car Co. pfd.			99	100½	+1½
Peerless Motor Car Co. com.			130	145	+30
Peerless Motor Car Co. pfd.		
Portage Rubber Co. com.			42	..	..
Portage Rubber Co. pfd.			92	94	..
*Reo Motor Truck Co.			17	18	-¼
*Reo Motor Car Co.			32½	34½	-½
Splitdorf Electric Co. pfd.		
Stewart-Warner Speed. Corp. com.			65½	67	-½
Stewart-Warner Speed. Corp. pfd.			105	107	..
Studebaker Corporation com.			99	101	..

No quotations available at this time on account of war.

	1914		1915		Wk's
	Bid	Asked	Bid	Asked	Ch'ge
Studebaker Corporation pfd.			102	103	-2
Swinehart Tire & Rubber Co.			85	90	..
Texas Company			48½	50	+1
U. S. Rubber Co. com.			104	105	+1
U. S. Rubber Co. 1st pfd.			219	220	-1
Vacuum Oil Company			110	..	..
White Company pfd.			169	171	-15
Willys-Overland Co. com.			105	106½	+1
Willys-Overland Co. pfd.		

OFFICIAL QUOTATIONS OF THE DETROIT STOCK EXCHANGE ACTIVE STOCKS

Chalmers Motor Co. com.	99½	88	..	..	..
Chalmers Motor Co. pfd.	..	96½	97½	..	+¼
Continental Motor Co. com.	155	180	270	295	-5
Continental Motor Co. pfd.	..	75	83	86	..
General Motors Co. com.	..	..	211	216	-4
General Motors Co. pfd.	..	..	107	109	-1
Maxwell Motor Co. 1st pfd.	..	..	89	91	+2½
Maxwell Motor Co. 2d pfd.	..	..	36½	38	+1
Maxwell Motor Co. com.	..	..	43½	46	+2½
Packard Motor Car Co. com.	..	..	115	..	..
Packard Motor Car Co. pfd.	..	..	97	99½	..
*Reo Motor Car Co.	20	21	33	33½	..
*Reo Motor Truck Co.	12	13	17½	18½	+½
Studebaker Corporation com.	..	..	107	110	+12
Studebaker Corporation pfd.	..	..	105	108	+2

INACTIVE STOCKS

*Atlas Drop Forge Co.	19	27	30	..	+2
Ford Motor Co. of Canada, Ltd.	..	560	1490	1525	+15
Kelsey Wheel Co.	..	..	205	..	..
*W. K. Prudden Co.	..	20½	20¼	22	..
Regal Motor Car Co. pfd.	23	..	21	..	..

BONDS

General Motors, notes, 6s, 1915.	100	..	..	..	..
Packard Motor Car Co. 5s, 1916.	..	..	98½	..	+¼

*Par value \$10; all others \$100 par value.

Mass. Headlight Report

No Discrimination in Matter of Design—Height Limit 4 Ft.—10 Ft. in Front

BOSTON, MASS., Aug. 24—At a meeting of the advisory committee selected to aid the Massachusetts Highway Commission in framing some legislation to govern motor headlights the committee today busied itself with a draft of a report its secretary wrote out following the last meeting a week ago. It was voted not to recommend any particular device to the Highway Commission, but to make a general recommendation that would allow the use of devices of various kinds so that the owner of a car need not go to a lot of expense to equip his machine, and visiting motorists would not be held up relentlessly. Members of the committee told of experiments they made with ground glass, pieces of tissue paper, and paint on bulbs and lenses showing that it would be possible to alter the rays and still give light to see the road.

One of the main points discussed was the lighting of the sides of the road. So it was voted to embody this feature in the report. Another matter discussed was the use of the searchlights that are being used now by some motorists and which may be operated to swing up, down and all around anywhere. It was voted that the regulation should cover their use to prevent their being operated promiscuously other than to find the road at night. The report was finally put into shape and all five members of the committee signed it and it was forwarded to the Highway Commission. No member of the committee is identified with any devices so their report will carry some weight.

The Report

The report drafted by the committee and those who signed it are as follows:

"We, the undersigned, comprising the advisory committee in motor headlights, in the interest of public safety recommend a regulation by the Massachusetts highway commission prohibiting the use of any headlights and searchlights which shall project their rays to a greater height than 4 ft. along level ground; and requiring such lights to illuminate the ground from 6 to 10 ft. from each side of the car at a point 10 ft. in front of the vehicle.

"From our investigations we find that to comply with such regulations will not impose a hardship upon any owner of a motor vehicle, for there are innumerable inexpensive devices available for lowering the light rays, some of which may be

easily made at home in a few minutes."

J. H. MacAlman, President Boston Automobile Dealers Assn. Prof. C. E. Stewart, Franklin Institute. Dr. Herbert T. Boyd, Bay State A. A. W. G. Renwick, Massachusetts State A. A. Lawrence G. Brooks, Highway Safety League.

The report was forwarded to the Highway Commission this afternoon. The commission will put some such regulation in force, and it will become a State law so that no city or town may then pass ordinances on the subject. It will not go into effect, perhaps, until late in the fall after the touring season is over so it will not affect visiting tourists to any great extent.

Springfield, Mo., Passes Glare Ordinance

SPRINGFIELD, MO., Aug. 20—The city council this week passed an anti-glare headlight ordinance providing penalties of a fine from \$1 to \$100 or jail sentence of from five to sixty days or both.

The new law provides that the uppermost ray of light from an automobile lamp must not be more than 6 ft. above the ground at a point 100 ft. or more ahead of the machine. The ordinance further provides that the center ray of light from any automobile lamp shall not deviate under any circumstances from a line parallel with the center line of the automobile. The latter clause prevents the use of revolving searchlights.

Seattle Taxi Ordinance Wrong

OLYMPIA, WASH., Aug. 16—The Supreme Court, in a decision finds that the Superior Court of King county at Seattle, was in error when it enjoined taxicab companies from stationing cabs and soliciting passenger and baggage traffic anywhere except in a restricted area specified in a Seattle city ordinance.

The city passed the ordinance naming the streets near depots and wharves where taxis could solicit business, and resorted to wholesale arrests of drivers when taxicab companies insisted on soliciting near depots on private ground owned by transportation companies, with permission of the companies.

100 Arrested for Headlight Glare

ST. LOUIS, MO., Aug. 20—One hundred automobile drivers and owners were arrested within a few minutes during one night here recently and were charged with violation of the new anti-glare ordinance. The first six of these to be tried in the police court were fined \$6 and costs, but in each case the fine was stayed on the payment of court costs and the promise of the defendant never again to violate the ordinance.

Abbott Creditors Get Dividend

Amounts to 34% and Makes 90% Paid—10% More Coming

DETROIT, MICH., Aug. 20—Creditors of the Abbott Motor Car Co. have received a dividend of 34 per cent on their claims from the Security Trust Co., trustee. This makes a total of 90 per cent that has been paid back to the creditors, and within a short time another 10 per cent is to be distributed, making 100 per cent settlement.

This state of affairs was brought about by the Abbott company giving a mortgage in favor of its creditors. Then the Consolidated Car Co. succeeded the Abbott company and assumed this mortgage, agreeing to pay the trustee 40 per cent of its gross receipts monthly. By this method the mortgage is practically wiped out, and the Consolidated concern is said to be operating on a firm financial basis.

Detroit Body Creditors Meet Aug. 27

DETROIT, MICH., Aug. 20—Creditors of the bankrupt Detroit Body Co. will meet on Aug. 27 to take action on the petition of the Security Trust Co., trustee, to consider certain offers of settlement made by two concerns which are creditors of the Detroit Body Co. One of these, Richard, Halstead & Quick, has instituted an attachment suit on the property of the bankrupt, but it agrees to take 50 per cent and discontinue this attachment suit. The other, the F. B. Ensley Co., for which the Union Trust Co. is acting as receiver, has agreed to take 60 per cent of its claim and release the money it has garnished. The Security Trust Co. recommends that the former offer be rejected and that the latter be accepted.

Minneapolis Reduces Accidents

MINNEAPOLIS, MINN., Aug. 21—A large reduction in the number of automobile accidents has resulted since the Minneapolis Civic & Commerce Association opened its complaint bureau 2 weeks ago following nine deaths and more than 100 accidents in a single month. The postmaster has changed all mail collection boxes to the right side of the street for automobile trucks that gather the mail. W. S. Milnor, secretary of the State automobile examining board, has asked the committee for suggestions as to the main essentials applicants should master. This followed the failure of 100 prospective jitney drivers to pass the State examination. Complaints are being tabulated as a basis for this ex-

amination. Drivers will have to have photographs affixed to their licenses. Citizens have been made special officers for the arrest of offenders against the automobile laws, in addition to the thirty members of the Automobile Club secretly serving in the same capacity.

The Civic & Commerce Association has issued a list of Don'ts for drivers.

Ford Rebate Checks Go Out in Order of Sales of Cars

DETROIT, MICH., Aug. 23—These days the Ford Motor Co. is paying out money on the same enormous scale as it makes cars. Ten thousand of the profit sharing checks are being mailed daily to all parts of the country. At this rate the distribution of more than 300,000 checks to buyers coming under last season's refund agreement will be completed within 30 days. Each check is for \$50, and they are going to all sorts of purchasers—big corporations, small dealers, private individuals are sharing alike.

Sign Five at Once

For several weeks now, a large force of stenographers has been busily filling in the names of the 300,000 on the checks, the amount of which is printed on the face. Then they have to be signed by one of the three assistant cashiers, which is a big job in itself. To lighten this labor, a device is used which signs the five checks on a sheet at one operation of the pen.

In nearly every case, the checks are being mailed in chronological order, that is, in the order in which the sales were made. From this it will be evident that it is considerable trouble to give away \$15,000,000.

22,505 Passenger Cars in Maryland

BALTIMORE, MD., Aug. 21—That passenger cars are on the increase at a lively rate in Maryland, is shown by figures just compiled under the direction of H. A. Roe, automobile commissioner of Maryland. During the first 7 months of 1915 license were issued to more than the total of 1914. During last year a total of 18,269 licenses for passenger cars were issued. During the first 7 months of this year the total reached 22,505.

Licenses for trucks are the only ones which have failed to beat out last year's total but with 5 more months to go it looks as though these licenses will far outnumber last year's total. This total last year was 2940 and up to Aug. 1 of this year it was 2650.

Bijur Employees on Strike

HOBOKEN, N. J., Aug. 20—Four hundred and fifty workers in the plant of the Bijur Motor Lighting Co., this city, have gone on strike.

Jitney Common Carrier in Wis.

Placed Under Control of Utilities Board—Must File Bond and Carry Sign

MILWAUKEE, WIS., Aug. 21—Wisconsin's jitney bus law is now a law, Gov. E. L. Phillip having given his approval to Chapter 546, Laws of 1915, passed Aug. 18. The bill places jitney buses under the control and regulation of the railroad commission of Wisconsin, commonly known as the State public utilities board.

The act provides that every firm, person or corporation operating any motor vehicle for hire and affording a means of local, street or highway transportation similar to that afforded by street railways is declared to be a common carrier, and is required to furnish adequate service at reasonable rates and to operate over such general routes or within such territory, and during such hours as may be reasonably required for the accommodation of the public.

In brief, the act requires that every person, firm or corporation operating any motor vehicle for the purposes above described, must file with the railway commission an indemnity bond issued by some authorized surety or indemnity company providing direct liability for all damages, not exceeding \$2,500 for any one person or \$5,000 for any one accident that may be recovered against the operator of such vehicle. If any such bond so filed shall become inoperative, such vehicle shall not be operated until a bond meeting the requirements shall have been filed.

The bond is to be accompanied by an application for acceptance by the railroad commission, stating the name and residence of the applicant, the general route, or the territory over which it is proposed to operate the motor vehicle described in the bond, the proposed hours of such operation, and the rate of fare to be charged for carriage therein. The commission is to determine if the route, territory, hours of operation, character of service and the rates are reasonable and adequate.

The commission is required to issue certificates and the holder must plainly mark his vehicle with the words, "Bonded Carrier" in letters not less than 2 in. high and lines not less than ¼ in. wide, followed by the number of the certificate. The mark may either be painted on the sides of the vehicle or fastened securely in a conspicuous place on the sides.

Carrying Capacity Limited

The law prohibits any such vehicle from transporting a larger number of

passengers than the number specified in the bond as the carrying capacity. Every city, village or township within or through which any such vehicle may be operated is permitted to require local consent for its operation, and as a condition of such consent it may be required that operators pay a reasonable compensation for the repair and maintenance of pavements and bridges; compensation for the regulation of street traffic or any other expense occasioned by the operation of such vehicle.

The law provides a fine of not less than \$10 nor more than \$100, or a county jail sentence of not less than 10 days nor more than 90 days for violation of the act.

The Independent Jitney Bus Assn. of Milwaukee, the largest and strongest organization of jitney operators, has accepted the new law and will work under its provisions at once without protest.

Thompson Jitney Law Upheld

LOCKPORT, N. Y., Aug. 21—The Thompson jitney law has been upheld in this city by Justice C. H. Brown, of the Supreme Court, who has granted the Public Service Commission an injunction restraining the Lockport-Olcott Motor Bus Line from operation until it obtains a certificate of necessity from the State body and a license from the city of Lockport.

The court holds that the motor bus line is a common carrier for hire within the city limits and is thus amenable to the statute.

N. D. Registrations Number 23,175

BISMARCK, N. D., Aug. 21—In the State of North Dakota more than \$20,000,000 is invested in automobiles. Up to July 31, 1915, State Secretary Thomas Hall reported 23,175 cars registered, with expectation of 1000 more before the end of the calendar year.

As compared with the same period in 1914, the gain in automobiles registered is 6433. Fees received from automobile registration this year to date are \$69,525. Last year the amount was \$53,793.

In 1914, after July 31, only 605 cars were registered, but the outlook for 1915 is much better. The population of the State is estimated at 625,000, or there is one car for every twenty-six persons.

Deaf Mute Cannot Drive in New Jersey

TRENTON, N. J., Aug. 20—A precedent has been established by the New Jersey Department of Motor Vehicles, which has revoked the driver's license of C. H. Over, Jr., of Asbury Park, a deaf mute. The ruling states that a deaf mute is not competent to operate an automobile. The use of special mirrors mounted on each side of the windshield of his car, so that he could see cars approaching from the rear on either side, was not sufficient.

35 Cars on Wisconsin 5-Day Tour

Business Replaces Competitive Feature—Schedule Calls for 22 M. P. H.

MILWAUKEE, WIS., Aug. 23—The 5-day sociability and business tour of the Milwaukee Automobile Dealers, Inc., started from the Hotel Wisconsin at 8 o'clock this morning. Twenty-five cars, including pilot, pacemaker and relief cars, were checked out on schedule time, and at least ten more cars are starting from Milwaukee to-day and to-morrow to join the tourists along the route.

As reported in THE AUTOMOBILE last week, the principal reason for the tour is to boost the annual Wisconsin State Fair, to be held at West Allis, Milwaukee, from Sept. 13 to 17, inclusive. Another reason is that no annual State reliability tour is being held this year, as for 5 years past, and the dealers require some fitting substitute to fill the gap. A third reason is that this is the psychological moment for stirring up and stimulating interest in the 1916 car of America, now out and ready for delivery.

The tour takes in the route traveled during the 1913 reliability tour of the Wisconsin State Automobile Association. The schedule is fast and averages about 22 m.p.h., allowing a maximum of ½ hr. at important points for the inspection of the cars by townspeople. At luncheon stops and night controls more time is given for this purpose. There is no competitive feature, and the tour is for show purposes only.

Rector Marmon Distributor in Northern California—Parker in Washington

INDIANAPOLIS, IND., Aug. 21—The H. B. Rector Co. has contracted to handle the Marmon exclusively in San Francisco and in the northern California territory. The agency for the Marmon car was formerly held by Walter C. Morris. Mr. Rector, the head of the new company, was sales manager for the Pierce-Arrow Pacific Sales Co. for several years.

A contract has also been closed with the Parker Motor Car Co. of Seattle as dealer for the Marmon in the State of Washington. The Parker company has been agent for the Pullman for several years.

Denver Co. to Distribute Hupp and Locomobile

DENVER, COL., Aug. 20—The Hupp Motor Sales Co., a \$60,000 corporation, has been organized by W. R. Woods, P. E. Chamberlain and F. E. Simonton, Denver, to distribute the Hupmobile in

Colorado and adjacent Rocky Mountain territory. They have opened temporary quarters at 220 Sixteenth Street, and are erecting a new building at 1260 Broadway. Belmont Walters, for some time traveling representative of the Hupp Motor Car Co., Detroit, is now employed by the new distributing agency to cover Colorado and a part of New Mexico and Wyoming. The new firm has also secured the agency for the Locomobile, which had not been represented in this territory for about 3 years.

Trying to Unionize Boston Repair Shops

BOSTON, MASS., Aug. 21—The labor officials are making a determined effort to unionize all the motor repair shops in Boston. For some time the organizers have been working quietly and they have succeeded in getting a number of places unionized. Other shops are partly so. The only demand they have made so far is for an 8 hr. day.

Some of the dealers have held out, however, and they intend to keep an open shop if possible. But the labor men are working along outside lines to accomplish their ends. In the case of one big distributor who sells cars and trucks and who refused to bother with the union, the officials went to some of the big concerns that bought his trucks. One of these was a brewery, and the beer people were told that they had better install their own repair shop and have it run under union conditions. This was done. Then they found a shop that was unionized, and to other owners of trucks whose employees were unionized, they sent word to have the repairs made at the union shop. So the service station of the dealer has been losing the repair trade on the trucks right along. This plan is being followed with other concerns.

Needham Tire Co. Busy

NEEDHAM, MASS., Aug. 22—At the plant of the Needham Tire Co. the men are now working 16 hr. a day and plans are under way to make it a two-shift force. The company has had to install new machinery and the orders have been piling in so fast that the makers are working hard to catch up.

The company has been in existence about a year, but it has thrived so that plans have been made to erect a new four-story structure addition, and capital is available now for increasing the facilities to any extent that the officials desire.

Skilled workmen were hard to secure, and the factory officials decided to develop its own men and apprentices. In this way the plant has grown, and now an additional 1000 miles is being added to the guarantee.

Plan Boston Dealers' Syndicate

To Finance Dealers and Store Cars Pending Delivery to Purchasers

BOSTON, MASS., Aug. 23—Plans are under way to form a syndicate in Boston that will finance motor car dealers and store their cars pending the delivery of them to purchasers. W. J. McDonald, who is a real estate operator, is forming the syndicate, and the first move was to purchase property in Boston containing 275,000 sq. ft. It backs up on the Boston & Albany railroad. The plans call for the construction of an immense building with some 200,000 sq. ft. of floor space, and which will be capable of accommodating 1000 cars. It will be one-story, with plans for additional stories if needed later.

Spur tracks and loading platforms will be put in so that cars may be run right in from the freight trains and stored there. On their receipt the agents will be notified and then they may borrow money on the cars to finance their deals instead of going to banks. The warehouse will be fireproof and thoroughly modern. The syndicate will have a capitalization of \$500,000.

At present some of the dealers are paying high rent for storage in buildings far removed from their plants, and this method will allow some of them to get along with less space in their regular headquarters, the space thus vacant being available for salesrooms or service departments. The location of the new warehouse is convenient, for it is not far from the big service station of the Packard, which marks the Western boundary of the motor district on Commonwealth Avenue. Full particulars have not been given out yet by Mr. McDonald, but it is expected that the plans will all be made public shortly. Stock in the enterprise may be offered to some of the dealers.

Robertson Not to Enter Racing Field

NEW YORK CITY, Aug. 20—A report that George Robertson was to return to the automobile racing field, and was entered in the coming meet at Sheepshead Bay, is without any foundation.

Newark Show in February

NEWARK, N. J., Aug. 21—This city is to have a show some time in February, probably shortly following the New York show. It will be staged under auspices of the New Jersey Automobile Trade Assn. in connection with the municipal committees arranging for the festivities planned for the 250th anniversary of the

founding of the city. The location of the show has not been decided as yet, but there is a possibility of the erection of a special building for exhibition purposes, which would serve for the holding of the automobile show. Later, the building would be occupied by the "Made in Newark" association, and exhibits of local factories, business organizations and stores.

Detroit Studebaker Branch Has Special Service for M. D.'s.

DETROIT, MICH., Aug. 23—Recognizing the seriousness of having his car laid up, the doctor who runs a Studebaker car in this city is to be insured against any trouble with his own car by the Studebaker branch here. In the event any member of the medical profession who drives a Studebaker meets with an accident or has his car disabled or out of commission, the new service policy that has been inaugurated provides that anywhere within a radius of 25 miles of Detroit, it will be only necessary for the doctor to notify the service station, when his car will be taken there for attention, and during the time it is there, the doctor will be given the use of another.

Free Gasoline Day in Halifax

HALIFAX, N. S., Aug. 20—C. L. Newman, Limited, 16-22 Argyle Street, Halifax, N. S., recently inaugurated what was termed as Free Gasoline Day. It was worked as follows: One day each week all gasoline sold by them was absolutely given away. A sales slip was given every purchaser of gasoline each day he bought gas, showing the amount of his purchase. A duplicate was kept by the company. On the first day of the following week it was decided which day was to be free on the past week and refunded to each customer the amount he bought on that date.

Crumley King Distributor

DETROIT, MICH., Aug. 20—A. A. Crumley, formerly factory sales representative for the Hudson Motor Car Co. in the east, lately factory representative for the King Motor Car Co. in the same territory, has formed the A. A. Crumley Co., Inc., and will locate at Woodward and Warren Avenues, Detroit, where he will be King distributor for Michigan.

King Holds Annual Outing

DETROIT, MICH., Aug. 21—The King Motor Car Co., this city, held its annual outing to-day when it entertained in camp representatives of its parts makers and suppliers. About 160 gathered at the plant before the thirty cars started for the camp.

Fifteen Entries for Twin City

Speedway Practically Completed—Race May Begin at 1 P.M.—Denver Tour Postponed

MINNEAPOLIS, MINN., Aug. 21—With the Twin City Speedway practically completed, interest in the preliminary trials, Aug. 28, 30 and 31, is aroused. A nominal fee is to be charged spectators. A circuit of the 2-mile concrete track at a speed of 80 m.p.h. is necessary for entry in the 500-mile World's Derby on Sept. 4. The request that the race begin at 1 p. m. instead of 10 a. m. for the benefit of tradespeople and office clerks is being considered.

Entries to Aug. 21 were:

Car	Driver
Ogren	Tom Alley
Sebring	O. F. Haibe
Duesenberg	Ed. O'Donnell
Duesenberg	Pete Henderson
Duesenberg	Billy Chandler
Stutz	Earl Cooper
Stutz	Gil Anderson
Peugeot	D. Resta
Peugeot	Ralph Mulford
Peugeot	Robert Burman
Peugeot	John Aitkin
Peugeot	Howard Wilcox
Delage	Barney Oldfield
DuChesneau	W. W. Brown
Mercedes	De Palma

Three F. R. P. cars are expected, also Sunbeam team.

Denver Reliability Tour Postponed 1 Day

DENVER, COL., Aug. 20—The 860-mile reliability and economy tour scheduled to start from Denver through the mountains Sept. 6, has been postponed to start a day later. The change has been decided upon because of several Labor Day events thought liable to interfere with entries for the run. The tour will cover 6 days, with noon and night controls at Hot Sulphur Springs, Steamboat Springs, Meeker, Glenwood Springs, Grand Junction, Montrose, Gunnison, Salida, Canon City, Pueblo and Colorado Springs.

The official sanction of the American Automobile Association has been secured, and the contest will be conducted according to the regular A. A. A. rules, with necessary modifications to admit a wider range of cars than would come under the strictly stock-car requirements.

Three Mercers for Corona

CORONA, CAL., Aug. 18—The Corona road race is to be held Nov. 20. This decision was reached at the final mass meeting held at Corona Monday night.

The committee appointed to raise the money to finance the race reported that all the stock had been sold with many purchasers anxious to secure more than they had been allowed to buy. Directors

were appointed and instructed to incorporate the new racing organization.

Three Mercers were entered as soon as it was announced that there would be a race. G. R. Bentel of Los Angeles, entrant of the cars, announced that Eddie Pullen, winner of the last Corona race would be on hand to defend his title at the wheel of a Mercer.

It was suggested at the meeting that the race be stretched to 400 miles but the project was not well received and while the committee has the right to lengthen the course, it is at present assured that the 1915 Corona classic will be a 300-mile event.

Fisher Resigns from Sheepshead Bay Corporation—Harkness His Successor

NEW YORK CITY, Aug. 24—Carl G. Fisher, president of the Indianapolis Motor Speedway and of the Sheepshead Bay Speedway, has resigned as head of the Sheepshead speedway and H. S. Harkness, prominent in the early racing days, has succeeded him. Mr. Harkness will be remembered for his record drive on July 12, 1904, up Mount Washington, N. H., in a Mercedes, when he negotiated the 8-mile hill in 24:37 3/5.

Three Duesenbergs for Narragansett

NARRAGANSETT, R. I., Aug. 19—Eddie O'Donnell, Willie Haupt and Peter Henderson, all driving Duesenbergs, are entered in the 100-mile race to be held on the opening event of the new Narragansett Park Speedway, Sept. 18. A Bugatti, owned by C. W. Fuller of Pawtucket, is the other entrant. It will probably be driven by George Hill.

2-Day Race Meet for Spokane

SPOKANE, WASH., Aug. 16—The Spokane Interstate Fair has set aside 2 days Sept. 13 and 14 for automobile racing on the fair grounds. The purses offered are \$1,000 a day to be divided into two classes. One purse each day of \$600 will go to professional drivers, and \$300 each day will go to local drivers and the balance or \$100 each day will go to the winners of feature events.

Jim Parsons in his Parsons Special, Frank Elliott in a Gordon Special, Fred Barsby and F. Stratton are entered.

The race will be run under the sanction of the newly organized Inland Automobile Assn.

1916 Kellogg Pump Design Unchanged

ROCHESTER, N. Y., Aug. 20—The Kellogg Manufacturing Co. of Rochester, N. Y., announces that its different models of Engine Driven Tire Pumps will be continued in their original design for 1916. The bearings in the new pumps will be lined with babbitt, bronze having been used in the past.

The Kellogg company is building an addition to its factory.

Factory Miscellany

Cleveland Ford Buys Land—The Cleveland Ford Tire Co., Cleveland, Ohio, has purchased 4 acres of land at Ash-tabula along the New York Central Railroad, foot of Benefit Street.

Parts Concerns Not Affiliated—The Auto Parts Co. of Chicago announces that it has no branch houses and is not affiliated with any firm in the United States using the same name.

Simplex Adds—The Simplex Automobile Co., New Brunswick, N. J., has awarded contracts for the construction of a two-story, 70 by 100 ft. addition to its plant. The estimated cost is \$20,000.

McClurg Rubber Plant to Work—E. A. Crawford has been discharged as receiver of the McClurg Rubber Co., Coshoc-ton, Ohio. The company is installing equipment and plans to start its plant within a very short time.

Rush Delivery Leases Plant—The Rush Delivery Car Co., Inc., Philadelphia, Pa., has leased the recently constructed four-story and basement building at 1007 North Front Street for the manufacture of commercial vehicles.

Firestone Issues House Organ—The Firestone Tire & Rubber Co., Akron, Ohio, has begun the publication of a new house organ, *The Firestone*. It is intended for circulation among all employees and includes the many branches throughout the country.

Touraine to Add—The Touraine Com-pany, Broad and Huntingdon Streets, Philadelphia, Pa., manufacturer of the

Vim truck, has had plans prepared for a factory building 85 by 250 ft. to be erected at the northeast corner of Twentieth Street and Montgomery Avenue.

Duff Extending—The Duff Mfg. Co., Pittsburgh, Pa., manufacturer of the Barrett lifting jack, is building an extension to the main plant, 150 by 125 ft. With the addition the main building will be 625 ft. in length and 125 ft. in width. All equipment has been furnished and is being equipped.

To Rebuild Howard Rim Plant—Plans are already under way to rebuild the plant of the Howard Demountable Rim Co. of Trenton, N. J., which was completely destroyed by fire on Wednesday of last week. It is proposed to enlarge the plant and to make the new building fireproof throughout. It is planned to resume operations in the new plant within ninety days.

Mogul Truck Builds—Increased orders have caused the Mogul Motor Truck Co., St. Louis, Mo., to erect a large assembling plant on Forest Park Boulevard, west of Sarah Street. This building will be a modern daylight factory, with every known modern appliance to facilitate the rapid assembling of motor trucks. This company has purchased enough ground west of this new building to enable it to erect an addition for storage and repairs, which it contemplates building in the near future.

Studebaker's Enameling Plant Pro-gressing—The Studebaker Corp., De-

troit, is soon to occupy its new build-ing being erected for the enameling and stamping departments. This is a struc-ture 320 ft. long by 70 ft. wide and four stories high. It is to be known as Plant 27, and adjoins the Plant 3 group of buildings. The most modern type of quantity enameling apparatus is being installed. Air in the enameling room is to be washed and the walls are to be specially prepared to catch any dust or dirt in the air. A large bank of enameling ovens will take care of the drying of the dipped metal parts.

Hartford Machine Screw Adds—Ad-ditions to the plant of the Hartford Machine Screw Co., Hartford, Conn., are rapidly nearing completion. In May sev-eral old buildings, including the offices, were torn down to make room for two spacious new buildings—one a six-story structure, 206 ft. long by 465 ft. wide, and the other a large two-story building with a convenient railroad siding which improves shipping facilities considera-bly. These two new buildings will give a total increase in floor space of about 80,000 sq. ft. In addition to housing the new general offices of the company, de-signs for furnishing of which contem-plate the most modern and approved equipment and efficiency devices, the new buildings will afford space for ex-tensive additions to the manufacturing facilities of the plant. It is expected that the new buildings will be completely occupied and running to full capacity by the first of September.

The Automobile Calendar

Aug. 23-28.....Milwaukee, Wis., Wiscon-sin Reliability Tour.
Aug. 26.....Ventura, Cal., Show.
Aug. 30.....Columbus, O., Show, Ohio State Fair, Columbus Auto. Show Co.
Sept.....Peoria, Ill., Second North-western Road Congress.
Sept. 4.....Twin City, Minn., 500-Mile Race; Twin City Motor Speedway Co.
Sept. 6-9.....Worcester, Mass., Show, Dealers' Assn.
Sept. 6-10.....Indianapolis, Ind., Show, Indiana State Fair.
Sept. 6-15.....Detroit, Mich., Show, Michigan State Fair.
Sept. 8-11.....Hamline, Minn., 2-Day Meet at State Fair Grounds between Minne-apolis and St. Paul, State Fair.
Sept. 13-17.....Milwaukee, Wis., Show, Automobile Dealers' Assn.
Sept. 13-17.....Oakland, Cal., Pan-Ameri-can Road Congress.
Sept. 17-18.....Peoria, Ill., Illinois Garage Owners' Assn. Con-vention.
Sept. 18.....Providence, R. I., 100-Mile Race, Narragansett Park Speedway, Inc.
Sept. 18-25.....Los Angeles, Cal., Show, Shrine Auditorium.

Sept. 20-25.....San Francisco, Cal., In-ternational Engineering Congress.
Sept. 24.....Indianapolis, Ind., S. A. E. First Section Meeting.
Sept. 27-Oct. 10...Denver, Col., Show, Inter-national Soil Products Exposition, Automobile Trades Assn. of Colorado.
Oct.....Dallas, Tex., Show, Dallas Automobile Dealers' Assn.
Oct.....Los Angeles, Cal., Broad-way Automobile and Flower Show, Automobile Dealers' Assn.
Oct. 1-2.....Trenton, N. J., Track Races; Inter-State Fair.
Oct. 2.....New York City, Sheepshead Bay Motor Speedway Track Meet.
Oct. 2.....Fresno, Cal., 150-Mile Race, District Fair, Fresno County Agricultural Assn., C. G. Eberhard.
Oct. 2-9.....Cincinnati, Ohio, Show, Mus-ic Hall, Cincinnati Au-tomobile Dealers' Assn.
Oct. 3-10.....St. Louis, Mo., Show, For-est Park Highlands, St. Louis Automobile Manu-facturers and Dealers' Assn.
Oct. 4, 5, 6.....Columbus, O., Garage Owners Convention.

Oct. 6-16.....New York City, Ninth Elec-trical Exposition and Mo-tor Show at Grand Cen-tral Palace.
Oct. 9.....Indianapolis, Ind., 100-Mile Invitation Race, Motor Speedway.
Oct. 11-12.....Dayton, O., National Pav-ing Brick Manufacturers' Assn., Annual Meeting.
Oct. 14.....Chicago, S. A. E. Standards Committee Meeting.
Oct. 16.....Chicago, Ill., 350-Mile Race, Chicago Speedway.
Oct. 18-19.....Cleveland, O., Hotel Statler, Sixth Annual Convention, Electric Vehicle Assn. of America.
Nov. 1-3.....Pasadena, Cal., Show, Hotel Green, Walter Hempel.
Nov. 18.....Arizona 150-mile Grand Prix.
Nov. 20.....Corona, Cal., Road Race.
Nov. 29-Dec. 4....Electric Prosperity Week.
Dec. 31.....New York City, Show; Grand Central Palace.
Jan. 22, 1916....Chicago, Ill., Show; Col-iseum.
Jan. 24-29.....Buffalo, N. Y., Show, Buf-falo Automobile Dealers' Assn., Broadway Audi-torium.
March 4-11.....Boston, Mass., Truck Show, Mechanics Bldg.

The Week in the Industry



McGonigal Office Mgr.—S. A. McGonigal has been appointed office manager of the Studebaker Corp., Detroit, Mich.

Wetzel Assistant Manager—D. H. Wetzel, closely associated for some time with the Mott Wheel Works at Utica, N. Y., in an advertising and sales way, has been appointed assistant manager of the works.

Boyd Baltimore Mgr.—F. M. Boyd has been made manager of the Tire Mart, Baltimore, Md., recently opened at 1419 North Charles Street. Mr. Boyd was formerly with the Knight Tire Co. as sales manager. E. C. Heid will succeed him.

Oliver, Ford Dealer, Resigns—The oldest dealer in point of service with the Ford Motor Co., Detroit, Mich., L. C. Oliver, head of the Ford agency at Jacksonville, Fla., has retired. The agency is to be converted into a branch under the management of F. P. Fariss of Atlanta.

Hayden Resigns—Don Hayden has resigned as district manager for the Saxon company and joined the Higgins-Sutherland Motor Co., Indianapolis, Ind. This company was recently organized to handle the Hupmobile and Saxon cars, having forty counties on each car in the central part of the State.

Dulmage Seattle Chevrolet Dealer—W. S. Dulmage, until recently a prominent automobile distributor of Portland, Ore., has established the Northwest headquarters for the Chevrolet car in Seattle and opened sales rooms at 1726 Broadway. His contract calls for the distribution of 1500 of the Chevrolet cars in the Northwest this season.

Davenport Heads K. C. Velie—E. D. Davenport is president of the recently organized Velie Motor Co. of Kansas City, which succeeded the Velie-Thorp Motor Co. The latter company has become the Thorp Motor Co. and continues in its previous location at 1506 McGee Street. The Velie Motor Co. of Kansas City is establishing itself at 1616 McGee Street.

Bell a Ford Dealer—H. O. Bell, who has been identified with the automobile business in Spokane for the past 9 years, and recently wholesale manager for F. A. Williams, Ford agent in Spokane, has taken the Ford agency for Missoula, Mont., and contracted to dispose of 300 Ford cars for 1915 and 1916. Mr. Bell was originally from Indianapolis, where he learned the automobile business under Carl G. Fisher.

Motor Men in New Roles

Forbes Resigns—T. C. P. Forbes, who has been sales manager of the Monarch Motor Car Co., Detroit, has resigned that position.

Romig Kearns Sales Mgr.—Reide Romig has been appointed general sales manager of the Kearns Motor Truck Co., Beavertown, Pa.

Hines Is New Pres.—H. J. Hines is the new president of the Toledo Machine & Tool Co., Toledo, Ohio. He has been general manager for many years.

Folger Marathon Tire Rep.—C. M. Folger has been appointed Southeastern representative of the Marathon Tire & Rubber Company, with headquarters at Atlanta, Ga., and will travel that section.

Stokes Goes to Boston—W. S. Stokes, formerly identified with one of the big advertising agencies in Chicago, has gone to Boston, Mass., to join the sales force of the Oakland Motor Car Co. and have charge of the retail sales.

Bell King Sales Mgr.—Kenneth Bell, who was formerly with the Pasadena Studebaker agency and later with the Love Motor Car Co., Washington, D. C., has been appointed sales manager of the Grace Motor Car Co., Pasadena, Cal., agent for the King line.

Blakeslee Heads Midgley Agency—The Midgley Tire & Rubber Co. of Lancaster, Ohio, has closed with the Crescent Automobile Co. of Jersey City to represent it in the northern half of New Jersey. George Blakeslee is head of the Crescent Automobile Co.

Holton Farmack Sales Mgr.—Hoover Holton, connected with the sales department of the Briggs-Detroit Co., Detroit, and prior to that sales manager of the Monarch Motor Car Co., has taken the position of general sales manager of the Farmack Motor Co., Chicago.

Newell St. Louis Sun Agent—J. E. Newell, of the Motor Car Co. bearing his name in St. Louis, will direct the sales campaign of the recently organized Sun Motor Car Co., Buffalo, N. Y., in Arkansas, Mississippi, Louisiana, southern Illinois, eastern Missouri and parts of Indiana, Kentucky and Tennessee.

White Detroit Rep.—A. F. White of New York City, has been appointed Far Eastern representative for the Detroit. His territory includes Burma and Ceylon, India, Federated Malay States, Strait Settlements, China, Japan and Philippine Islands. Mr. White has direct representation at all points named.

Hough Makes Change—P. R. Hough, formerly assistant manager of the Ford Motor Co.'s branch assembling plant at Denver, Col., has gone into partnership with H. E. Maines, Chevrolet and Monroe distributor. The new firm, under the name of the Maines-Hough Motor Co., is located at 439 Broadway.

Schreiber Resigns—A. O. Schreiber, who has been connected with the Saxon Motor Co. for the past year in the capacity of district representative for the state of Ohio, has resigned from that company to assume the management of the Loveland Co., Seventeenth and Euclid Avenue, Cleveland, which handles the Saxon exclusively.

Rose Heads Frisco Chalmers—L. H. Rose, formerly serving in the capacity of district and coast representative for the Studebaker, Maxwell and Lozier factories, has recently re-entered the automobile trade in the West, taking charge of the northern California distributing agency for the Chalmers car, with headquarters in San Francisco.

Fillmore Pasadena Ford Mgr.—E. M. Fillmore, formerly traveling representative of the Los Angeles Ford branch, has been placed in charge of the newly opened Pasadena branch of the Ford company. C. D. Tucker has been appointed assistant manager to have charge of the sales department. There are to be twenty-five men employed by the new branch, which is the largest automobile house in Pasadena.

Dornfeld Making Engine—J. F. Dornfeld, president of the defunct Dornfeld-Kunert Iron Works, Watertown, Wis., has purchased the assets and organized as the Dornfeld Iron Works. The company will make a specialty of extras and repairs on automobiles and has established a well-equipped department for this purpose. A foundry and machine shop is being conducted and the concern is manufacturing gas engines and gas producers.

Crockett Hardman Tire Sales Mgr.—W. A. Crockett has been named as sales manager for the Hardman Tire & Rubber Co., Bellville, N. J. For some time Mr. Crockett has been in charge of the Baltimore branch of the Hardman factory for some time, and before coming there was responsible for the placing of a number of Hardman branches around the country. He assumed his new duties the latter part of the week. The Baltimore branch of the firm is now in charge of C. B. Brooks, who has been assistant manager to Mr. Crockett.

Auction Sales in Montreal—Pearce & Lakser have opened up automobile auction rooms in Montreal, where they purpose holding weekly sales.

Dunlop Co. Adds—Sayer & Ford, Vancouver, B. C., distributors of the Dunlop Tire Co., have enlarged their premises, acquiring an extra store recently vacated by the B. & B. Automobile Co.

Vancouver Co. Moves—N. L. Tullis, of the Wood-Milne agency, is removing from 851 Pender Street West to nearer Granville Street, Vancouver, B. C., where he will have more commodious quarters.

Gets Large Territory—The Wentworth-Fosdick Co., that has just taken the wholesale distribution of the Dort, has part of Maine, southern New Hampshire and Vermont, Massachusetts, Rhode Island and Connecticut for its territory.

Ajax Branch in Spokane—R. W. Hoerner and J. R. Jones have established an Ajax tire factory branch in Spokane, Wash. Contracts closed by the Ajax company on the Pacific Coast this year are 135 per cent in advance of last year.

Takes the Rauch & Lang—W. S. Jameson, who has been identified with the Peerless sales force in Boston, Mass., for some years, has taken the Rauch & Lang electric line for New England, with salesrooms at 618 Commonwealth Avenue, Boston.

Savannah Supply Co. Opens New Department—An up-to-date automobile department has been put in operation by the Georgia Supply Co. at 14-16 West State Street, Savannah. The new department will be under the management of W. S. Blun, assisted by Mr. Hockley M. Garmany.

Porterville Garage Moved—The Central Garage, Porterville, Cal., formerly located on Second Street, has moved into the newly erected Smith building. The proprietors, Messrs. Eckard and Niles, have extended their factory connections also. They now have the agencies for the Paige, Overland and Ford lines.

Topeka Tire Co. Moves—The equipment Tire Co., Robbins Bros., proprietors, has moved from its location at 117 East Seventh Street to 930 Kansas Avenue, Topeka, Kan., where it has increased its equipment, and now has an up-to-date vulcanizing tire repair shop with free tire oil and gasoline service; the free gasoline service is within 5 miles of the city and the free tire is within 10 miles of the city.

Los Angeles Firestone Adds—In order to secure greater storage capacity, the Los Angeles, Cal., branch of the Firestone Tire & Rubber Co. has leased the room adjoining its location at 1239 South Olive Street with the second floor and basement. The Firestone branch will

acquire 5000 additional feet of floor space. The local branch receives at least three carloads of tires from the factory at Akron weekly and storage room is required for from 9000 to 10,000 tires.

New Garage Co. in Winnipeg—The Great West Motor Co., Winnipeg, has been organized for the purpose of taking over the business of the Canadian Motor Co. which has gone into voluntary liquidation. The new company has leased the two garages controlled by the Canadian Motor Co., and will conduct a general garage and repair business but will handle no car agencies. The capital stock of the Great West Motor Co. is \$50,000 and the concern will be under the management of H. De Cew.

Announces a Motor Street Cleaner—The Kindling Machinery Co., Milwaukee, Wis., manufacturing a line of horse-drawn street cleaning, sprinkling and washing machines, has brought out a motor-driven washer which is being tested by the street department of the City of Milwaukee. In a recent test one machine cleaned 110,000 square yards of asphalt pavement in an 8-hour run. The machine resembles a conventional motor truck type, the body platform being occupied by a large steel tank. Water is sprayed at the front end and just in front of the rear axle there is a revolving rubber blade roller which scrubs the pavement.

Recent Minnesota Garage Changes—a garage at Wentworth Street and St. Anthony Avenue, Midway, in which to store twenty-eight cars. The building is 80 by 88 ft., one story and brick. The Motor Transfer Co., 137 Eleventh Street, St. Paul, will occupy a new \$65,000 garage at Temperance and Grove Streets, on Sept. 15. M. J. O'Connor is erecting a one-story garage at 138 Fourteenth Street for the Michaud Transfer Co., Seventh and Wabasha Streets, St. Paul. W. L. Harris, W. L. Harris Realty Co., Marquette Avenue and Sixth Street, Minneapolis, is erecting a public garage at 912-914 Third Avenue S., to cost \$15,000. It is one story and brick. Simon Kruse, Hotel Radisson Co., Minneapolis, is erecting a garage adjoining the building at Second Avenue South and Seventh Street. It will be two stories. The Mutual Auto Co., 313-319 West First Street, Duluth, will occupy a new garage, Oct. 1, at Superior Street and Third Avenue East. The garage will have 5000 sq. ft. of space more than in the old quarters. President E. J. Filiatrault expects to have a Ford assembling plant there in twelve months.

Trade News from Denver—G. E. Hanan, 1210 Broadway, Denver, Col., distributor of the Crescent, Allen and Vulcan cars, has dropped the last two and taken on the Pullman to handle along with the Crescent. L. G. Palmer, 1515 Cheyenne Place, Denver, has taken

over the business of the Western Motor Car Co., of which he was president, and is now distributor for the Paige exclusively, having given up the Abbott-Detroit and the Willys and Garford trucks.

The Platt-Fawcett Motor Co., 1249 Broadway, Denver, has dropped the Chalmers and is now distributing the Stearns and Mitchell. This is the first time the Stearns has been represented in this territory for a year or more. H. E. Maines, distributor for the Chevrolet and Monroe, has moved from 1811 Glenarm Place, Denver, Col., to 439 Broadway, where he has larger quarters. The Exchange Auto Co., which recently opened a used car and garage business at 1216 Broadway, Denver, reports a substantial business in used cars. Warriner & Cochran, agents for the Maxwell at Denver, have moved from 1624 Broadway to the new Maxwell branch headquarters at 1248 Broadway.

J. H. Callahan & Co., have opened a Cleveland Spring Cranker agency at 1616 Broadway, Denver, Col. One member of the new firm is Bert Clark, formerly agent for the Boston Ford Starter Co. L. E. Kelton, formerly Haynes salesman for E. J. Johnson, has secured the Haynes agency for Colorado, and has opened temporary headquarters at 1616 Broadway, Denver. The Mid-West Auto Sales Co., Colorado distributors for the King, Jackson and Regal, have moved from 220 Sixteenth Street to 1512 Broadway, Denver. A. W. Eaton, formerly manager of the Denver branch of the Underwood Typewriter Co., is the new manager of the Colorado Motor Car Co., 1512 Broadway, Denver, distributors of the Reo, Saxon and Cole. Mr. Eaton recently made a record drive of 320 miles over the mountains from Denver to Glenwood Springs by way of Colorado Springs, Ute Pass, Buena Vista, Leadville and Tennessee Pass in 11 hours and 50 minutes in an eight-cylinder Cole, and averaged more than 15 miles per gallon of gasoline. Bert Clark and W. H. Jones have formed a partnership to handle the Chevrolet on a sub-agency basis for Denver, and have located at 1616 Broadway. The Regal Sales Co. is the name of a new partnership formed by E. B. Tibbals and C. E. Anderson as the Denver local agency for the Regal, Jackson and King. The Overland Auto Co. has been doing a lively business since moving into its new quarters at 1200 Broadway, Denver, and reports the outlook favorable for selling 1000 or more cars in the Rocky Mountain territory during the 1916 season. The 1915 sales went beyond the 600 mark, as against a little more than 300 for 1914. The Automobile Sales Corp., Studebaker and Franklin distributors, have moved from 1512 Broadway, Denver, into new and larger quarters at 1504 Cheyenne Place to take care of increased business.

Marsh Co. Formed—The H. C. Marsh Sales Co. has been formed in Pontiac, Mich., by H. C. and W. A. Marsh to sell automobiles and accessories.

Willard Branch in Toledo—A new branch of the Willard Storage Battery Co. has been opened at 2027 Euclid Avenue, Toledo. C. H. Rempes is manager.

Seattle Chandler Moves—The Northwest Motor Car Co., Seattle Chandler dealer, has moved into new and more commodious quarters at 1708 Broadway.

Mohawk Tire Co. Moves—The Hinkle Tire & Rubber Co., Columbus, Ohio, distributor for the Mohawk tires, has moved from 186 East Gay Street into larger quarters at 179 East Gay Street.

New Chalmers Station in Newark—The Chalmers Motor Co., Newark, N. J., has awarded the contract for the construction of a new automobile station and service department on Broad street.

Cleveland Co. in New Quarters—The H. & G. Motor Co., Cleveland, O., is now in its new quarters at 1844 Euclid avenue. The company handles the Lozier and Regal and is planning to take on the Empire.

Baltimore Dealer Moves—The Wilson Motor Co., dealer in Maxwell and Mitchell cars, 1014 Morton Street, Baltimore, Md., will move to 605 West North Avenue. T. W. Wilson, Jr., is head of the firm.

New Baltimore Battery Agent—The Beam Motorcar Co., Cathedral and Chase Streets, Baltimore, has become the service and sales station for Philadelphia storage battery.

New Minneapolis Cadillac Building—The Northwestern Cadillac Co. has leased 55 ft. of frontage at 23 Ninth Street S., Minneapolis, for a new building for its business. The building will be one story concrete.

New Los Angeles Tire Firm—J. S. Wiese and John Boss have opened a tire house and vulcanizing plant at 723 South Olive Street, Los Angeles, Cal. The firm is to do business under the name of Boss & Wiese.

Tire Mart in Baltimore—The Tire Mart, 1419 North Charles Street, Baltimore, Md., has opened. F. M. Boyd, who for some time has been connected with the sales force of the Lambert Automobile Co., has become the manager.

Gisholt Machine to Add—The Gisholt Machine Co., Madison, Wis., one of the largest manufacturers of turret lathes, machine tools, etc., in the Middle West, will erect two new steel buildings, a machine shop, 175 by 112 ft., and a storehouse, 45 by 112 ft.

San Diego Accessory Co. Changes—Roberts & Flemming, San Diego, Cal., have taken over the San Diego County agency for the complete accessory, tire and oil lines carried by the Weinstock-

Nichols Co., one of the largest accessory concerns on the Pacific Coast.

To Make Ford Steering Device—W. J. Laughlin, a Beloit inventor, is establishing a small shop for the manufacture of auxiliary steering devices for Ford and other cars. It will be known as the Steerautomat and is a malleable iron appliance connected to the front axle, holding the wheels in a straight line.

Want to Handle Another Car—Potter & McCormick, Pomona, Cal., Chandler agents, have moved into their new building on South Thomas Street. The firm is now handling the Chandler exclusively but it has been announced that the company is looking for the agency of a car which will not conflict with the Chandler, a car selling for less than \$1,000 factory.

Repairs Worn Shoes—The Lockstitch Double Tread Tire Co., 1840 E. 13th street, Cleveland, O., is repairing worn and unserviceable shoes. The process consists of the combining of two used casings into one thoroughly serviceable casing. Blow-outs and puncture holes, also small breaks, are first repaired. One casing is then lockstitched on top of the other by means of a double or triple row of stitching around the entire circumference.

Milwaukee Co. Moves—The Schreiber-Boorse Motor Car Co., National and Chandler agent at Milwaukee, and located at 180 Fifth Street for nearly ten years, will move to the east side, into the heart of the new car and supply district that has been developed in the last 3 or 4 years. A large two-story garage building will be erected on Oneida Street near Jackson Street, at once. It will be of steel and concrete slab construction, 68 by 120 ft. in size.

New Louisville Openings—J. B. Kennedy Co. has opened a garage and repair shop at the corner of Jackson Street and Broadway, Louisville, Ky. Frazier & Miller have opened a tire and car repair shop at 601 E. Broadway. The company also carries a complete line of accessories. The Southern Motors Co., 615 South Third Street, which handles the Dodge, Hudson and Packard pleasure cars and the Detroit electric, has opened its electric garage department. It is equipped to handle fifty cars.

Changes in Arizona Overland—An important change has been made in the Huntsman-Hotchkiss Overland Co., Arizona, distributing agents for all the Willys cars. H. H. Hotchkiss, who has heretofore managed the Tucson office of the company, has assumed charge of the office and salesroom in Phoenix. D. B. Hutchins, former manager here, has become agent for the county of Cochise, which includes the cities of Douglas and Bisbee. Northern Arizona will offer an especially attractive field for the automobile salesman next fall, according to Mr.

Hutchins, who has just returned from a 1000-mile trip through that section. Heavy summer rains have fallen and abundant range feed is assured. This means that the cattlemen and sheepmen will have plenty of money. In the course of his northern trip Hutchins appointed sub-agencies as follows: Williams, Davenport & Kirkpatrick; Flagstaff, Flagstaff Overland Company; Winslow, Winslow Overland Co.; Holbrook, Smith Overland Co.

Hercules Sales Co. Moves—The Hercules Sales Co., Louisville, Ky., which controls the selling rights for the Hercules car, has moved its offices from the Starks Building to the plant of the Kentucky Wagon Manufacturing Co., where the Hercules is now being manufactured. The output at present is ten cars a day. A. B. Challinor has been appointed sales manager of the Hercules Sales Co., Louisville, Ky. For many years he was connected with the General Motors Co., in charge of the sales in the Southern district.

New Arizona and New Mexico Chevrolet Distributor—The Babbitt-Polson Co., Williams, Ariz., has been appointed distributing agent for the Chevrolet car in Arizona and New Mexico. Sub-agencies are being established in all the principal cities and towns of the two States. Carroll Davis is to handle Chevrolets in Prescott and Yavapai counties, Arizona. His partner, Charles Carrow, has left Prescott and gone to Phoenix, where he has associated himself with Louis Garesche for the purpose of introducing the Chevrolet in Maricopa County.

Recent Ford Agency Changes—Davenport, Iowa, has been awarded one of the eighteen factory branches now being established by the Ford Motor Co. H. D. Rue, late of the Chicago branch, will be placed in charge. Two will be allotted to Iowa, Fort Dodge securing the other. The Davenport plant will be in part an assembling plant and will furnish parts and supplies to all agents and patrons in eastern Iowa. A building is now being sought for the Davenport agency. A. H. Cain of Roodhouse, has secured the Ford agency in Greene County, Ill., succeeding Morrow Bros. of Athensville. The Bloomington Motor Co., organized a year ago by J. C. Blair of Toledo, Ohio, to handle the Ford car in McLean County, Ill., with Bloomington as the distributing point, has been succeeded by the Lockwood, Mandel & Schwarzman Motor Co., with Oscar Mandel president; A. Schwarzman, vice-president, and J. E. Lockwood, secretary and general manager. The new company will erect a new garage building to cost \$25,000. The territory is to be enlarged to include Woodford County. McLean County has the distinction of being the leading distributor of Ford cars in Illinois outside of Chicago.

Automobile Agencies Recently Established

PASSENGER VEHICLES

Alabama

Aniston.....King.....Anniston Motor Car Co.
Florence.....King.....B. A. Rogers & Bros.

Alberta

Gleichen.....King.....John Boxty
Granum.....King.....W. P. Byer
High River.....King.....F. Pepper Garage
Langdon.....King.....Roy Gowan
Okotoks.....King.....Okotoks Garage
Red Deer.....King.....Mechanical Garage
Stettler.....King.....Bentley & Son

California

Anaheim.....Reo.....W. P. Quarton
Marysville.....King.....Yuba Machine Works
Pasadena.....Reo.....Floyd Purdy
Santa Ana.....KisselKar.....Chas. B. Perry
Ventura.....Reo.....N. P. Seeley

Colorado

Denver.....Oakland.....J. S. Morrison Auto Co.
Denver.....White.....Perry A. Mead
Fort Collins.....Oldsmobile.....Casson & Hopper
Fort Morgan.....Oldsmobile.....J. H. Croft
Trinidad.....Paige.....D. J. Penno
Trinidad.....Studebaker.....D. J. Penno

Florida

Pensacola.....Moon.....Pensacola Auto Supply Co.
Tampa.....Scripps.....Booth.....Beckwith-Wilson Co.

Georgia

Atlanta.....Pullman.....Pullman Southern Distributors
Macon.....Hupmobile.....Littlejohn Sales Co.

Illinois

Carlock.....Moline.....Knight.....Donat Widmer
Chattanooga.....Moon.....Thrasher Automobile Co.
Chicago.....Moon.....E. D. Knowles
Clinton.....Moon.....L. DeBoise
Danville.....Moon.....Raymond D. Smith
Flanagan.....Pullman.....T. B. Bennett & Co.
Galatia.....Oldsmobile.....H. W. Butler
Geneseo.....Moon.....E. G. Orr
Streator.....Franklin.....Central Garage

Indiana

Attica.....Oldsmobile.....Harmon Auto Co.
Darlington.....Hupmobile.....Peterson & La Follette
Greencastle.....Oldsmobile.....J. G. Campbell
Hartford City.....Oldsmobile.....Hartford Sales Co.
Marion.....Oldsmobile.....John V. Shugart & Son
Muncie.....Hupmobile.....D. C. Williston
South Bend.....Moline.....Knight.....Oscar Lippman
South Bend.....Scripps.....Booth.....William DeVall
Vincennes.....Scripps.....Booth.....D. D. Aldrich

Iowa

Ames.....King.....Jacobson Automobile Co.
Canova.....Overland.....J. A. Wick
Central City.....Apperson.....H. S. Butters
Coon Rapids.....Oakland.....Crow-Ribbal
Des Moines.....Moline.....Knight.....Stewart & Schooler
Des Moines.....Princess.....The Hawkeye Motor Sales Co.
Des Moines.....Pullman.....Pegau Auto Co.
Glidden.....Oakland.....E. D. Porter
Greenfield.....King.....Wilson Bros.
Hancock.....Oakland.....Wiese & Nicolai
Jefferson.....Moline.....Knight.....L. E. Jeffers
Marion.....Moline.....Knight.....C. C. Carpenter
Maquoketa.....Moline.....Knight.....F. R. Rozak
Menlo.....King.....Wilson Bros.
Monmouth.....Moline.....Knight.....H. R. Miller
Neola.....Oldsmobile.....Neola Auto Co.
Northwood.....Apperson.....Butter Auto Co.
Oskaloosa.....Apperson.....Zerring & Johnson
Perry.....King.....King Automobile Co.
Red Oak.....Moon.....Benard Peterson
Sioux City.....Apperson.....Pioneer Auto Co.

Kansas

Atchison.....Oldsmobile.....A. B. Campbell
Eldorado.....Overland.....Eldorado Overland Co.
Hutchinson.....King.....C. A. Livingston Auto Co.
Hutchinson.....Regal.....Regal Motor Sales Co.
Lewis.....Empire.....J. H. Wolcott
Osawatimie.....Allen.....E. G. Cresse
Osborne.....Reo.....Gilbert & Sons
Sabetha.....Oldsmobile.....G. E. Fletchell
Topeka.....Paige.....Palace Auto Co.
Waldron.....Moline.....Knight.....A. Grasser
Wichita.....Pullman.....Pullman Motor Co.
Winfield.....Buick.....Collision Auto Co.

Massachusetts

Boston.....MacFarlan.....Six.....F. P. Anthony
Boston.....Scripps.....Booth.....Scripps-Booth Motor Car Co.
Salem.....Oldsmobile.....Oldsmobile Co. of Salem
Springfield.....Scripps.....Booth.....Lyndon I. Philbrook
Springfield.....Studebaker.....Corson-Berry Co.
West Dennis.....Oldsmobile.....H. W. Nickerson
Worcester.....Grant.....Jernberg-Wheeler Co.

Michigan

Ann Arbor.....Oldsmobile.....Lucas & Schoettle Co.
Bad Axe.....Chevrolet.....McDonald Garage Co.
Battle Creek.....King.....E. E. Doty
Benton Harbor.....Oakland.....A. F. Messner
Birmingham.....Republic.....Cruze-Crawford Mfg. Co.
Breckenridge.....Oakland.....Fred Stevens
Breedsville.....King.....Bert Lee
Clare.....Dodge.....Clare Hardware & Implement Co.
Coral.....Dodge.....Thomas Kain
Grand Rapids.....Auburn.....Reid Auto Co.
Grand Rapids.....Hupmobile.....Geo. S. Thwing Co.
Holland.....Dodge.....Venhuizen & Kooyers
Houghton.....Hupmobile.....Earl Opal
Ionia.....Oakland.....Miller & Ashe
Jackson.....Regal.....Hazen Abbey
Laurium.....Studebaker.....Mort Getchell
Ludington.....Oldsmobile.....Harry V. Huston
New Baltimore.....Ford.....Overland.....Vossan & Son
Niles.....Oakland.....Stoll Bros.
Shepherd.....Regal.....D. A. Kennedy
South Haven.....Oakland.....Jake Neffeneggar
Standish.....Maxwell.....A. Hanses
Three Oaks.....Oakland.....Lopp & Hellenger
Wyandotte.....Hupmobile.....Clark & Wm. Bigler

Minnesota

Duluth.....King.....Zenith Auto Co.
Duluth.....Willys.....Overland.....Mutual Auto Co.
Ellendale.....King.....Laken & Berg
Elmore.....King.....W. O. Dustin & Co.
Hastings.....Oldsmobile.....Lovejoy & Johnson
Glenveill.....Oldsmobile.....Lang & Lukes
Lamberton.....King.....A. P. Hill
Lewiston.....King.....F. Eusterman & Co.
Minneapolis.....Indiana.....George Cromwell
Minneapolis.....Pullman.....A. M. Choate Auto Co.
Minneapolis.....Sphinx.....Santweizer-Finley Co.
Owatonna.....Oldsmobile.....Sander Bros.
Spring Valley.....Oldsmobile.....Geo. H. Harris
St. Paul.....Denby Truck.....Arend Bros.
St. Paul.....KisselKar.....J. F. Lynch

Missouri

Joplin.....Koehler.....Truck.....J. W. Gorsuch
Neosho.....Studebaker.....Neosho Auto Co.
Sedalia.....Koehler.....Truck.....LeGrande Garage
St. Louis.....Regal.....Trenton Motor Car Co.

Mississippi

Okolona.....Pullman.....W. L. Tyson

Nebraska

Avoca.....Metz.....Eugene Stutt
Bellevue.....Metz.....E. F. Stepp
Elm Creek.....Monitor.....Fred Pflaum
Fremont.....Maxwell.....Hall & Steele
Ord.....Grant.....Frank Beren
Gordon.....Moline.....Knight.....J. M. McGraw
Hampton.....Oakland.....Will Van Housen
Hastings.....Koehler.....Truck.....Stephen Schulz
Howells.....Oldsmobile.....Sindelar & Hanzel
Millard.....Oakland.....VanDohren Bros.
Ord.....Davis.....Frank Beren
Schuyler.....Oakland.....Boll & Zeaman
Scribner.....Apperson.....Henry Tonjes
Springfield.....Maxwell.....Albert Compton
Stamford.....Davis.....David Elder
Stamford.....Grant.....David Elder
Brock.....Studebaker.....F. J. Schmidt

New Hampshire

Nashua.....Auburn.....H. C. Dunn

New Jersey

Asbury Park.....Oldsmobile.....H. R. Ingalls
Jersey City.....Oldsmobile.....J. Jacob Wacker

New York

Amsterdam.....Pullman.....Shutts & Co.
Auburn.....Scripps.....Booth.....Charles A. Hadselle
Batavia.....King.....N. L. Hawks
Binghamton.....Scripps.....Booth.....Charles H. Worden
Catskill.....Oldsmobile.....H. W. Lasher
Chaffee.....King.....R. R. Allen
Hempstead, L. I.....KisselKar.....National Gaerag
New Rochelle.....Oldsmobile.....W. M. Bantel
Norristown.....KisselKar.....C. R. Hendricks

Rochester.....Pullman.....Ball-Washburne Motor Co.
Suffern.....KisselKar.....Peiper-Blanchard Garage
West New Brighton.....Oldsmobile.....Short & Wisely
S. I.....Scripps.....Booth.....George A. MacCracken
Utica.....Scripps.....Booth.....George A. MacCracken

Nevada

Elko.....Franklin.....The Simcox Garage

North Dakota

Hazleton.....Palmer.....Anderson, Hanawalt & Sneeberg
New Rockford.....King.....J. R. MacKenzie

Ohio

Arcanum.....Pullman.....Arcanum Garage
Athens.....Regal.....McCart Garage & Machine Shop
Bucyrus.....Hupmobile.....H. A. Smith
Canton.....Hupmobile.....Canton Hupmobile Sales Co.
Canton.....Regal.....Quality Motor Car Co.
Cincinnati.....Pullman.....Pullman Motor Car Co.
Cleveland.....Regal.....H. & G. Motor Co.
East Liverpool.....Hupmobile.....C. C. Kennedy
Findlay.....Hupmobile.....Harry Ramsey
Lancaster.....Hupmobile.....John A. Houston
Middletown.....Hupmobile.....Wm. Cork & Sons
Newark.....Regal.....Wiyarch & Beck
Sandusky.....Auburn.....Welby C. Waterfield
Toledo.....King.....Landman-Griffith Co.
Troy.....Oldsmobile.....Smith & Denamore
Warren.....Oldsmobile.....Miller & Troxel
West Liberty.....Oldsmobile.....John Hite
Weston.....Hupmobile.....Pugh & Jones
Youngstown.....Hupmobile.....E. C. Keller

Ontario

Brantford.....King.....Dr. F. G. Pearson
Orangeville.....King.....J. F. Atkinson

Pennsylvania

Bloomsburg.....Scripps.....Booth.....Housenick & Seiler
Harrisburg.....Pullman.....Bentz-Landis Auto Co.
Hughsville.....Pullman.....Shipman & Bartlow
Pittsburgh.....Pullman.....Pullman Sales Co.
Spring Mills.....Pullman.....E. P. Shook
Tamaqua.....King.....J. M. Knepper
Williamsport.....Pullman.....Ralph B. Harlacker

Montana

Circle.....King.....Ed. Storm
Jordan.....King.....M. A. Bogie
Miles City.....King.....E. Devaul
Rosebud.....King.....Fred Bills

South Dakota

Aberdeen.....Moline.....Knight.....K. O. Lee
Bonesteel.....Metz.....Ben Turgeon
Bruce.....Hupmobile.....V. G. Goodfellow

Tennessee

Chattanooga.....King.....Wallace Buggy Co.
Jellico.....Hupmobile.....H. M. Jones
Knoxville.....Moon.....City Garage & Transfer Co.
Memphis.....Oldsmobile.....The Oldsmobile Sales Co.

Texas

El Paso.....Franklin.....Franklin Motor Car Co.
Houston.....King.....Leo J. Trost, Prop.
Schulenberg.....King.....L. W. Worsham
Yorktown.....King.....Dr. I. E. Clark
Gus Zedler

Utah

Salt Lake City.....Franklin.....The Franklin Motor Car Co.

Vermont

Proctorsville.....Pullman.....Proctorsville Garage

Washington

Colfax.....Moon.....A. J. Davis
Spokane.....Scripps.....Booth.....Signal Truck Co.

Wisconsin

Grand Rapids.....Moline.....Knight.....C. L. Duncan
Manitowoc.....Moline.....Knight.....H. C. Schuette
Milwaukee.....Crow.....Elkhart.....John Teller Auto Co.
Milwaukee.....Velic.....Velic Motor Car Co.
Richland Center.....King.....E. L. Downs
Viola.....King.....Romer Kinder

West Virginia

Huntington.....Regal.....Apperson & Regal Sales Co.
New Cumberland.....Regal.....Scott Bros.

Wyoming

Pinedale.....Oldsmobile.....J. F. Paterson
Rawlins.....Chalmers.....Michael M. Rubne
Shoshoni.....Oldsmobile.....Stuchell & Junco